YAMAHA 2005

BT1100

5JN4-AE1

SUPPLEMENTARY SERVICE MANUAL

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and data for the Yamaha BT1100 (2005).
For complete service information procedures it is necessary to use this Supplementary Service Manual together with the following manuals.

BT1100 SERVICE MANUAL: 5JN1-AE1

BT1100 2005
SUPPLEMENTARY SERVICE MANUAL
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NOTICE

This manual was produced by the Yamaha Motor Italia S.p.A. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual, so it is assumed that anyone who uses this book to perform maintenance and repairs on Yamaha motorcycles has a basic understanding of the mechanical ideas and the procedures of motorcycle repair. Repairs attempted by anyone without this knowledge are likely to render the motorcycle unsafe and unfit for use.

Yamaha Motor Italia S.p.A. is continually striving to improve all its models. Modifications and significant changes in specifications or procedures will be forwarded to all authorized Yamaha dealers and will appear in future editions of this manual where applicable.

NOTE:
Designs and specifications are subject to change without notice.

IMPORTANT INFORMATION

Particularly important information is distinguished in this manual by the following notations.

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ WARNING Failure to follow WARNING instructions could result in severe injury or death to the motorcycle operator, a bystander or a person inspecting or repairing the motorcycle.

CAUTION: A CAUTION indicates special precautions that must be taken to avoid damage to the motorcycle.

NOTE: A NOTE provides key information to make procedures easier or clearer.

EAS00007

HOW TO USE THIS MANUAL

This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

① The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter.
Refer to "SYMBOLS".

② Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 ("PERIODIC CHECKS AND ADJUSTMENTS"), where the sub-section title(s) appears.

③ Sub-section titles appear in smaller print than the section title.

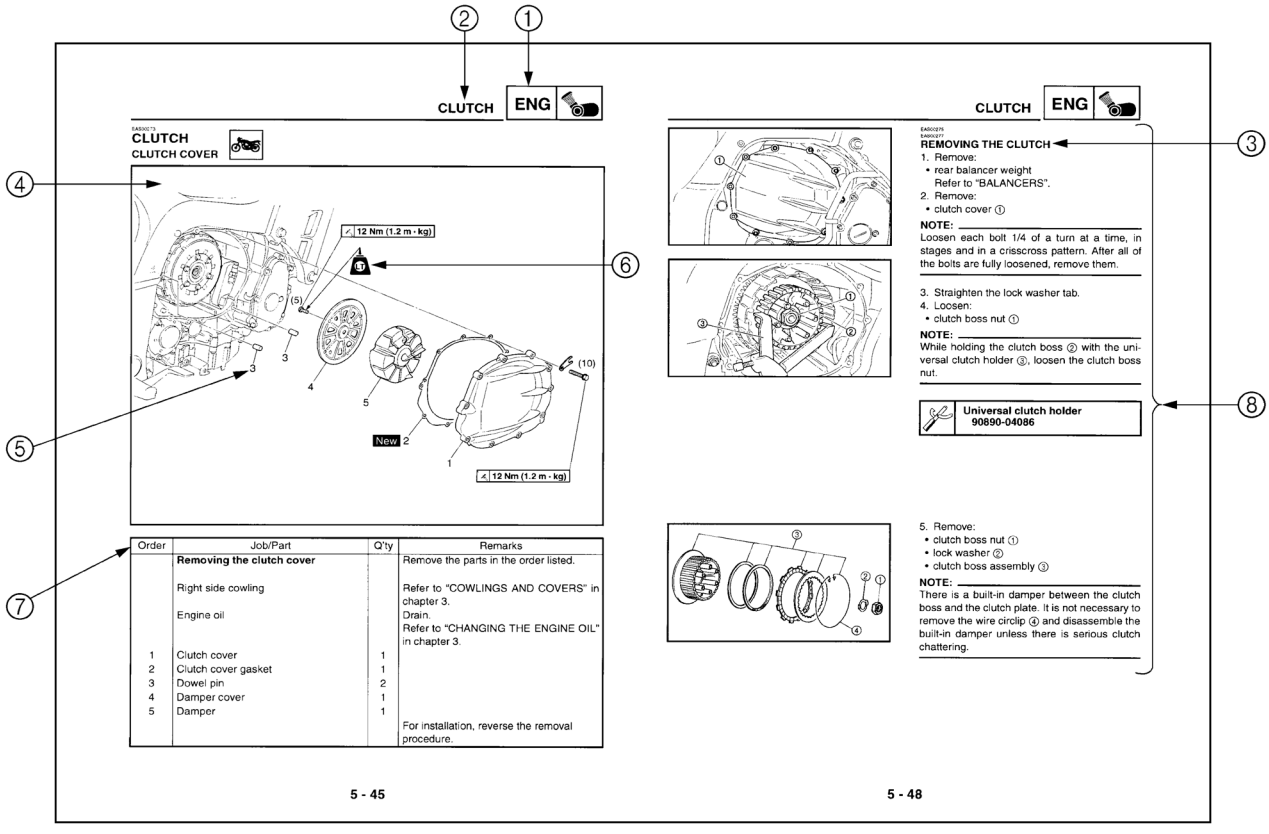
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

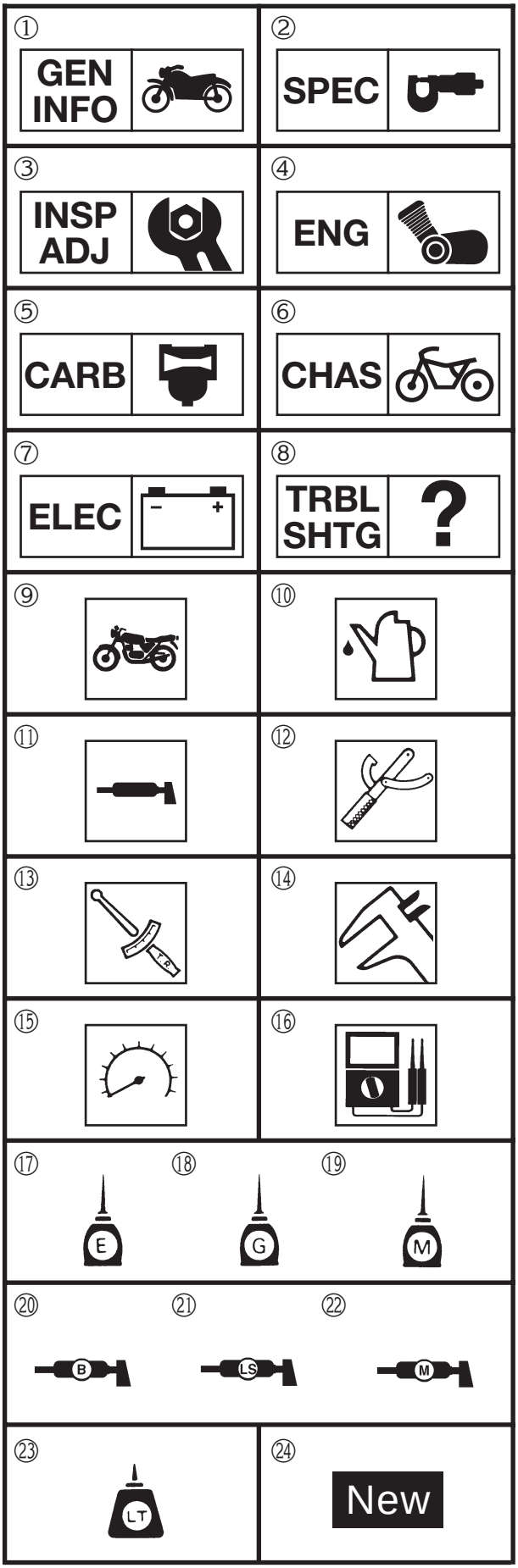
⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

⑥ Symbols indicate parts to be lubricated or replaced.
Refer to "SYMBOLS".

⑦ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

⑧ Jobs requiring more information (such as special tools and technical data) are described sequentially.





ILLUSTRATED SYMBOLS

The following symbols are not relevant to every vehicle.

Illustrated symbols ① to ⑧ are printed on the top right of each page and indicate the subject of each chapter.

① General information
② Specifications
③ Periodic inspections and adjustments
④ Engine
⑤ Carburetor
⑥ Chassis
⑦ Electrical system
⑧ Troubleshooting

Illustrated symbols ⑨ to ⑯ are used to identify the specifications appearing in the text.

⑨ Can be serviced with engine mounted
⑩ Filling fluid
⑪ Lubricant
⑫ Special tool
⑬ Torque
⑭ Wear limit, clearance
⑮ Engine speed
⑯ Electrical data

Illustrated symbols ⑰ to ㉒ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑰ Apply engine oil
⑱ Apply gear oil
⑲ Apply molybdenum disulfide oil
⑳ Apply wheel bearing grease
㉑ Apply lightweight lithium-soap base grease
㉒ Apply molybdenum disulfide grease

Illustrated symbols ㉓ to ㉔ in the exploded diagrams indicate the following:

㉓ Apply locking agent (LOCTITE®)
㉔ Replace the part

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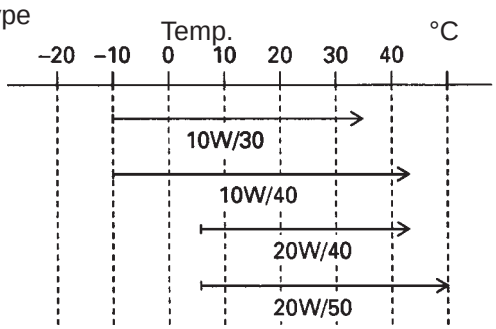
WIRING DIAGRAM

SPECIFICATIONS

GENERAL SPECIFICATIONS

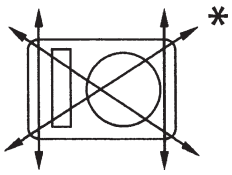
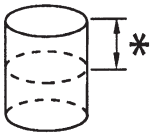
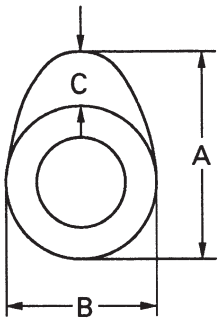
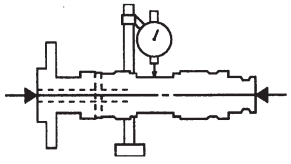
Item	Standard
Model code:	BT1100: 5JN4
Dimensions: Overall length Overall width Overall height Seat height Wheelbase Ground clearance Minimum turning radius	 2,200 mm 800 mm 1,140 mm 812 mm 1,530 mm 168 mm 2,980 mm
Weight: Dry (without oil and fuel) Wet (with oil and a full fuel tank) Bias weight (dry) front Bias weight (dry) rear Bias weight (wet) front Bias weight (wet) rear Maximum load-except motorcycle:	 233 kg 254 kg 109.5 kg 123.5 kg 122 kg 132 kg 200 kg
Engine: Engine type Cylinder arrangement Displacement Bore × stroke Compression ratio Compression pressure (STD) Starting system	 Air cooled 4-stroke, SOHC V-type 2-cylinder 1,063 L 95 × 75 mm 8.3 : 1 1,000 kPa (10 kg/cm², 10 bar) at 400 r/min Electric starter
Lubrication system:	Wet sump
Engine oil: Type 	 SAE20W40SE or SAE10W30SE Recommended engine oil classification: API Service SE, SF, SG or higher
Final gear oil:	Hypoid gear oil SAE 80 (API GL4)
Oil quantity: Engine oil Periodic oil change With oil filter replacement Total amount Final gear case oil Total amount	 3.0 L 3.1 L 3.6 L 0.2 L

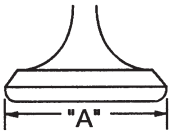
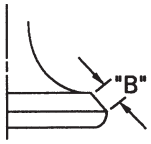
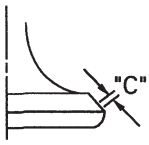
Item		Standard
Air filter:		Dry type element
Fuel:		
Type		Regular unleaded gasoline
Fuel tank capacity		20 L
Fuel reserve amount		5.8 L
Carburetor:		
Type/quantity		BSR37/2
Manufacturer		MIKUNI
Spark plug:		
Type		BPR7ES/W22EPR-U
Manufacturer		NGK/DENSO
Spark plug gap		0.7 ~ 0.8 mm
Clutch type:		Wet, multiple-disc
Transmission:		
Primary reduction system		Spur gear
Primary reduction ratio		78/47 (1.660)
Secondary reduction system		Shaft drive
Secondary reduction ratio		44/47 × 19/18 × 32/11 (2.875)
Transmission type		Constant mesh 5-speed
Operation		Left foot operation
Gear ratio	1st	40/17 (2.353)
	2nd	40/24 (1.667)
	3rd	36/28 (1.286)
	4th	32/31 (1.032)
	5th	29/34 (0.853)
Chassis:		
Frame type		Twin tube Backbone
Caster angle		25°
Trail		106 mm
Tire:		
Type		Tubeless
Size	front	120/70-ZR17 (58W)
	rear	170/60-ZR17 (72W)
Manufacturer	front	DUNLOP / METZELER
	rear	DUNLOP / METZELER
Type	front	D205F TL / MEZ3F TL
	rear	D205 TL / MEZ3 TL
Tire pressure (cold tire):		
0 ~ 90 kg load *	front	230 kPa (2.30 kg/cm²) (2.30 bar)
	rear	250 kPa (2.50 kg/cm²) (2.50 bar)
90 kg (198 lb) ~ Maximum load *	front	250 kPa (2.50 kg/cm²) (2.50 bar)
	rear	270 kPa (2.70 kg/cm²) (2.70 bar)
		* Load is the total weight of the cargo, rider, passenger and accessories.
Maximum load:		200 kg (total weight of rider, passenger, cargo and accessories)

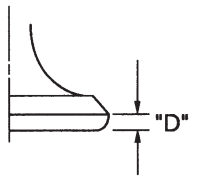
Item		Standard
Brake:		
Front brake	type	Dual disc brake
	operation	Right hand operation
Rear brake	type	Single disc brake
	operation	Right foot operation
Suspension:		
Front suspension		Telescopic fork
Rear suspension		Swingarm (link suspension)
Shock absorber:		
Front shock absorber		Coil spring/Oil damper
Rear shock absorber		Coil spring/Gas-oil damper/Spring preload adjustable
Wheel travel:		
Front wheel travel		130 mm
Rear wheel travel		113 mm
Electrical system:		
Ignition system		T.C.I. (digital)
Generator system		A.C. magneto
Battery type		GT14B-4
Battery capacity		12V 12Ah
Headlight type:		Quartz bulb (halogen)
Bulb voltage, wattage x quantity:		
Headlight		12 V 60 W/55 W x 1
Auxiliary light		12 V 5 W x 1
Tail/brake light		12 V 5 W / 21 W x 1
License plate light		12 V 5 W x 1
Front turn signal indicator light		12 V 10 W x 2
Rear turn signal indicator light		12 V 10 W x 2
Meter lighting		LED x 12
Neutral indicator light		LED x 1
Turn signal light		LED x 1
Oil level warning light		LED x 1
High beam indicator light		LED x 1
Fuel level warning light		LED x 1
Immobilizer system light		LED x 1

MAINTENANCE SPECIFICATIONS

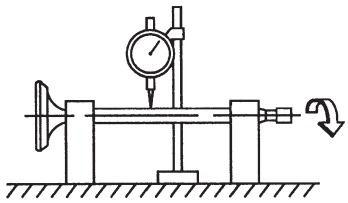
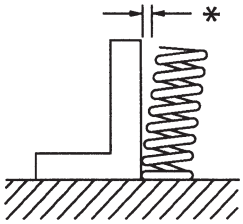
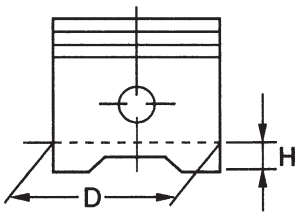
ENGINE

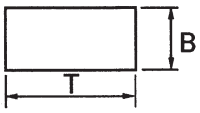
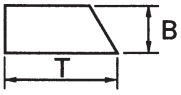
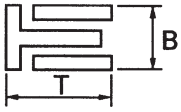
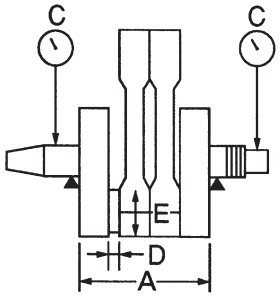
Item	Standard	Limit
Cylinder head:		
Volume	57.0 ~ 58.4 cm^3	•••
Warp limit * 	•••	0.03 mm
Cylinder:		
Bore size	95.00 ~ 95.01 mm	95.1 mm
Measuring point *	40 mm	•••
Max. out of round 	•••	0.01 mm
Camshaft:		
Drive method	Chain drive (left & right)	•••
Cam cap inside diameter	25.000 ~ 25.021 mm	•••
Camshaft outside diameter	24.96 ~ 24.98 mm	•••
Shaft-to-cap clearance	0.020 ~ 0.061 mm	•••
Cam dimensions: 		
Intake “A”	39.112 ~ 39.212 mm	39.012 mm
“B”	#1: 32.093 ~ 32.193 mm	#1: 31.993 mm
	#2: 32,127 ~ 32.227 mm	#2: 32.027 mm
“C”	7.162 mm	7.012 mm
Exhaust “A”	39.145 ~ 39.245 mm	39.045 mm
“B”	32.200 ~ 32.300 mm	32.100 mm
“C”	7.195 mm	7.045 mm
Camshaft runout limit 	•••	0.03 mm

Item		Standard	Limit
Timing chain:			
Timing chain type/No. of links		SILENT 98L	•••
Timing chain adjustment method		Automatic	•••
Rocker arm/rocker arm shaft:			
Bearing inside diameter		14.000 mm ~ 14.018 mm	14.036 mm
Shaft outside diameter		13.985 mm ~ 13.991 mm	13.95 mm
Arm-to-shaft clearance		0.009 mm ~ 0.033 mm	0.086 mm
Valve, valve seat, valve guide:			
Valve clearance (cold)	IN	0.07 ~ 0.12 mm	•••
	EX	0.12 ~ 0.17 mm	•••
Valve dimensions:			
 Head Diameter		 Face Width	 Seat Width
“A” head diameter	IN	47.0 ~ 47.2 mm	•••
	EX	39.0 ~ 39.2 mm	•••
“B” face width	IN	2.1 mm	•••
	EX	2.1 mm	•••
“C” seat width	IN	1.2 ~ 1.4 mm	1.8 mm
	EX	1.2 ~ 1.4 mm	1.8 mm
“D” margin thickness	IN	1.1 ~ 1.5 mm	0.8 mm
	EX	1.1 ~ 1.5 mm	0.8 mm
Stem outside diameter	IN	7.975 ~ 7.990 mm	7.955 mm
	EX	7.960 ~ 7.975 mm	7.935 mm
Guide inside diameter	IN	8.000 ~ 8.012 mm	8.042 mm
	EX	8.000 ~ 8.012 mm	8.042 mm
Stem-to-guide clearance	IN	0.010 ~ 0.037 mm	0.08 mm
	EX	0.025 ~ 0.052 mm	0.10 mm



Margin Thickness

Item		Standard	Limit
Stem runout limit		•••	0.03 mm
			
Valve seat width	IN	1.2 ~ 1.4 mm	2.0 mm
	EX	1.2 ~ 1.4 mm	2.0 mm
Valve spring:			
Free length	IN	44.6 mm	43.5 mm
	EX	44.6 mm	43.5 mm
Set length (valve closed)	IN	40 mm	•••
	EX	40 mm	•••
Compressed pressure (installed)	IN	160.7 N (16.4 kg)	•••
	EX	160.7 N (16.4 kg)	•••
Spring rate (K1)	IN	35.28 N/mm (3.6 kgf/mm)	•••
	EX	35.28 N/mm (3.6 kgf/mm)	•••
Spring rate (K2)	IN	45.37 N/mm (4.63 kgf/mm)	•••
	EX	45.37 N/mm (4.63 kgf/mm)	•••
Tilt limit *	IN	•••	2.5°/1.9 mm
	EX	•••	2.5°/1.9 mm
			
Direction of winding (top view)	IN	Clockwise	•••
	EX	Clockwise	•••
Piston:			
Piston to cylinder clearance		0.025 ~ 0.050 mm	0.15 mm
Piston size “D”		94.960 ~ 94.975 mm	•••
			
Measuring point “H”		5 mm	•••
Piston off-set		0 mm	•••
Piston pin bore inside diameter		22.004 ~ 22.015 mm	22.045
Piston pin outside diameter		21.991 ~ 22.000 mm	21.975

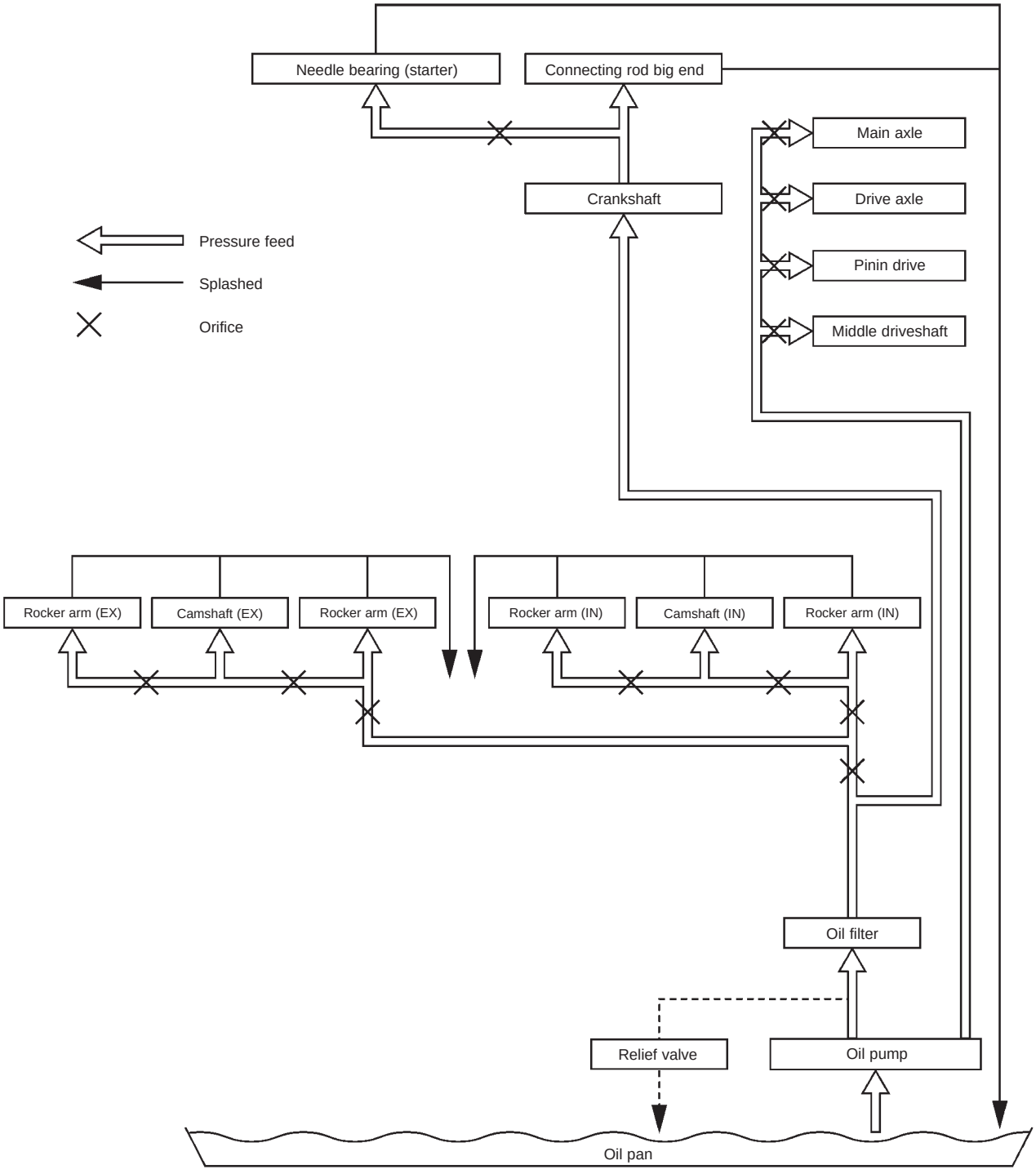
Item	Standard	Limit
Piston rings:		
Top ring:		
		
Type	Plain	•••
Dimensions (B x T)	1.5 × 3.8 mm	•••
End gap (installed)	0.3 ~ 0.5 mm	0.8 mm
Side clearance (installed)	0.04 ~ 0.08 mm	0.1 mm
2nd ring:		
		
Type	Taper	•••
Dimensions (B x T)	1.2 × 3.8 mm	•••
End gap (installed)	0.30 ~ 0.45 mm	0.8 mm
Side clearance	0.03 ~ 0.07 mm	0.1 mm
Oil ring:		
		
Dimensions (B x T)	2.5 × 3.4 mm	•••
End gap (installed)	0.2 ~ 0.7 mm	•••
Connecting rod:		
Oil clearance	0.044 ~ 0.073 mm	•••
Color code (corresponding size)	① Blue ② Black ③ Brown ④ Green ⑤ Yellow	•••
Crankshaft:		
		
Crank width “A”	101.95 ~ 102.00 mm	•••
Runout limit “C”	•••	0.02 mm
Big end side clearance “D”	0.320 ~ 0.474 mm	•••

Item		Standard	Limit
Clutch:			
Friction plate thickness		2.9 ~ 3.1 mm	2.8 mm
Quantity		8	•••
Clutch plate thickness		2.5 ~ 2.7 mm	0.1 mm
Quantity		1	•••
Clutch plate thickness		1.9 ~ 2.1 mm	0.1 mm
Quantity		7	•••
Clutch spring free length		7.2 mm	6.5 mm
Quantity		1	•••
Clutch housing thrust clearance		0.05 ~ 0.40 mm	•••
Clutch housing radial clearance		0.010 ~ 0.044 mm	•••
Clutch release method		Inner push, screw push	•••
Push rod bending limit		•••	0.5 mm
Transmission:			
Main axle deflection limit		•••	0.08 mm
Drive axle deflection limit		•••	0.08 mm
Shifter:			
Shifter type		Guide bar	•••
Shift fork thickness		5.76 ~ 5.89 mm	•••
Carburetor:			
I. D. mark		5JN4 10	•••
Main jet	(M.J)	#1:#128.8 - #2:#127.5	•••
Main air jet	(M.A.J)	#55	•••
Jet needle	(J.N)	5DL49-3	•••
Needle jet	(N.J)	P-0M (826)	•••
Pilot air jet	(P.A.J.1)	#63.8	•••
	(P.A.J.2)	#142.5	•••
Pilot outlet	(P.O)	1.0	•••
Pilot jet	(P.J)	#17.5	•••
Bypass 1	(B.P.1)	0.8	•••
Bypass 2	(B.P.2)	0.8	•••
Bypass 3	(B.P.3)	0.8	•••
Pilot screw	(P.S)	3.0	•••
Valve seat size	(V.S)	1.2	•••
Starter jet	(G.S.1)	#45	•••
Starter jet	(G.S.2)	0,9	•••
Throttle valve size	(TH.V)	#125	•••
Float height	(F.H)	11 ~ 12 mm	•••
Engine idle speed		950 ~ 1.050 r/min	•••
CO%		4 ~ 5%	•••
Intake vacuum		32.2 ~ 33.6 kPa (-242 ~ -252 mmHg)	•••
Engine oil temperature		75 ~ 85 °C	•••
Fuel pump:			
Type		Electrical type	
Model/manufacturer		UC-Z61B/MITSUBISHI	•••
Consumption amperage	<max>	0.8 A	•••
Output pressure		12 kPa (0.12 kf/cm^2)	•••

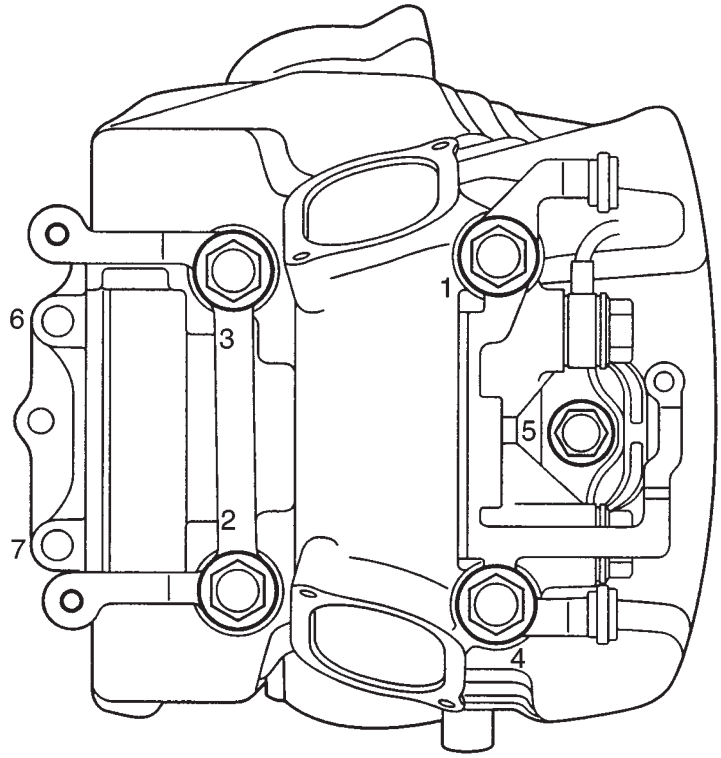
Item	Standard	Limit
Lubrication system:		
Oil filter type	Paper type	•••
Oil pump type	Trochoid type	•••
Tip clearance “A” or “B”	0.03 ~ 0.09 mm	0.15 mm
Side clearance	0.03 ~ 0.08 mm	0.15 mm
Bypass valve opening pressure	80 ~ 120 kPa (0.8 ~ 1.2 kgf/cm^2)	•••
Relief valve operating pressure	450 ~ 550 kPa (4.5 ~ 5.5 kgf/cm^2)	•••
Shaft drive:		
Middle gear backlash	0.1 ~ 0.2 mm	•••
Final gear backlash	0.1 ~ 0.2 mm	•••

Item	Standard

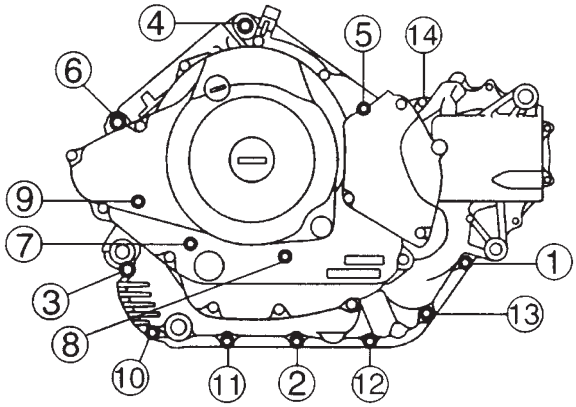
Lubrication chart:



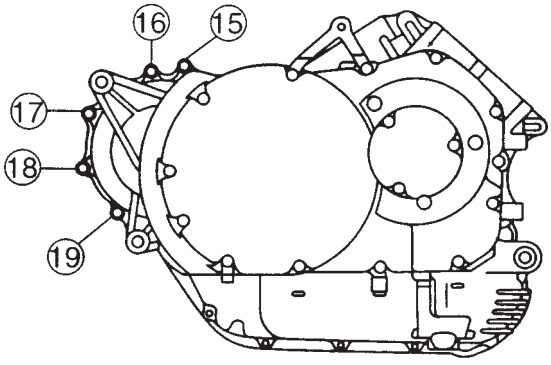
Cylinder head tightening sequence:



Crankcase tightening sequence:



Left crankcase



Right crankcase

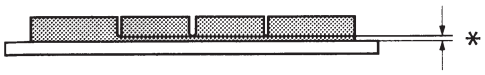
Tightening torques

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque		Remarks
				N·m	m·kg	
Cylinder head	Nut	M12	8	50	5.0	E
Cylinder head	Nut	M10	2	35	3.5	
Plate	Bolt	M8	2	20	2.0	
Cylinder head cover	Screw	M6	4	4	0.4	
Cylinder head (exhaust pipe)	Stud bolt	M8	4	12.5	1.25	
Rocker arm shaft	Union bolt	M16	2	37.5	3.75	
Camshaft sprocket cover	Bolt	M6	4	10	1.0	
Tappet cover	Bolt	M6	8	10	1.0	
Rocker arm shaft (oil passage)	Bolt	M16	4	38	3.8	
Stopper plate (camshaft)	Bolt	M8	4	20	2.0	Use lock washer
Spark plug	–	M14	2	20	2.0	
Cylinder	Bolt	M6	2	10	1.0	
Lower cylinder head cover	Bolt	M6	6	10	1.0	
Upper cylinder head cover	Screw	M6	8	5	0.5	
Connecting rod	Nut	M9	4	48	4.8	M
Rotor	Nut	M16	1	175	17.5	
Valve adjusting locknut	Nut	M8	4	27	2.7	
Camshaft sprocket	Bolt	M10	2	55	5.5	
Timing chain tensioner	Bolt	M6	4	10	1.0	
Timing chain tentioner cap	Bolt	M6	2	8	0.8	
Timing chain guide	Bolt	M6	4	10	1.0	
Oil pump	Bolt	M6	3	10	1.0	
Oil strainer cover	Bolt	M6	3	10	1.0	
Oil filter cover	Bolt	M6	5	10	1.0	
Oil pump gear	Bolt	M6	1	12	1.2	
Oil pump cap	Bolt	M6	1	10	1.0	
Oil delivery pipe (cylinder head)	Union bolt	M16	2	20	2.0	
(crankcase)	Union bolt	M10	1	20	2.0	
Oil drain bolt	–	M14	1	43	4.3	
Air filter:						
Air filter cover fastener	Screw	M5	2	2	0.2	
Carburetor cover fastener	Screw	M5	4	4.5	0.45	
A.I.S. system:						
A.I.S. system fastener (pump and piping)	Screw	M6	4	10	1.0	
A.I.S. system pipe fastener to engine starter	Screw	M6	1	10	1.0	
A.I.S. pump fastener to A.I.S. bracket	Screw	M5	2	8	0.8	
Exhaust system:						
Cylinder head and exhaust pipe joint	Nut	M8	4	20	2.0	
Exhaust pipe bracket	Screw	M8	2	25	2.5	
Exhaust pipe/exhaust pipe guard fastener (rear)	Screw	M8	2	20	2.0	
Exhaust pipe strap	Screw	M8	3	18	1.8	
Silencer fastener to passenger board support	Screw	M10	2	47	4.7	
Exhaust pipe guard fastener	Screw	M6	2	7	0.7	

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque		Remarks
				N·m	m·kg	
Crankcase (cylinder)	Stud bolt	M12	8	24	2.4	
Crankcase (cylinder)	Stud bolt	M10	2	20	2.0	
Crankcase	Bolt	M10	3	38.5	3.85	E
Crankcase	Bolt	M6	10	10	1.0	
Bearing retainer (middle drive pinion gear)	Bolt	M8	3	25	2.5	
Crankcase cover (left)	Bolt	M6	13	10	1.0	
Crankcase cover (right)	Bolt	M6	11	10	1.0	
Clamp	Bolt	M6	1	10	1.0	
One-way clutch	Bolt	M6	8	12	1.2	LT
Primary drive gear	Nut	M20	1	110	11.0	Use lock washer
Clutch spring	Bolt	M6	6	8	0.8	
Clutch adjuster	Nut	M8	1	12	1.2	
Clutch boss	Nut	M20	1	70	7.0	Use lock washer
Push lever axle	Screw	M8	1	12	1.2	
Middle drive pinion gear	Nut	M44	1	110	11.0	Stake
Bearing retainer (middle driven shaft)	Nut	M88	1	110	11.0	Stake
Yoke (middle driven shaft)	Nut	M14	1	–	–	Stake
Bearing housing (middle drive shaft)	Bolt	M8	4	25	2.5	
Shift lever stopper	Bolt	M8	1	22	2.2	E Use lock washer
Guide bar stopper	Screw	M6	2	7	0.7	LT
Shift dram segment	Screw	M5	1	4	0.4	
Shift arm	Bolt	M6	1	10	1.0	
Shift pedal adjuster	Nut	M6	2	10	1.0	1 of 2 has LH thread
Stator coil	Screw	M6	3	10	1.0	LT
Pickup coil	Screw	M5	2	7	0.7	LT
Starter motor	Bolt	M6	2	10	1.0	
Neutral switch	–	M10	1	20	2.0	
Ignition coil	Screw	M5	4	2.5	0.25	
Speed sensor	Bolt	M6	1	7	0.7	
Engine bracket:						
Rear fastener	Screw	M10	1	65	6.5	
Front fastener	Screw	M12	1	110	11.0	
Engine bracket fastener (front)	Special screw	M22	1	18	1.8	
Engine bracket fastener (front)	Nut	M12	1	85	8.5	

CHASSIS

Item		Standard	Limit
Steering system:			
Steering bearing type		Angular bearing	•••
Front suspension:			
Front fork travel		130 mm	•••
Fork spring free length		364.8 mm	•••
Fitting length		339.8 mm	•••
Collar length		150 mm	•••
Spring rate	(K1)	7.5 N/mm (0.75 kg/mm)	•••
	(K2)	12 N/mm (1.2 kg/mm)	•••
Stroke	(K1)	83 mm	•••
	(K2)	47 mm	•••
Optional spring		No	•••
Oil capacity		0.537 L	•••
Oil level		117 mm	•••
Oil grade		Fork oil 10W or equivalent	•••
Rear suspension:			
Shock absorber travel		60 mm	•••
Spring free length		175 mm	•••
Fitting length		162 mm	•••
Spring rate	(K1)	120 N/mm (12.23 kg/mm)	•••
Stroke	(K1)	0 ~ 60 mm	•••
Optional spring		No	•••
Swingarm:			
Free play limit	End	•••	0 mm
Front wheel:			
Rim size		Cast wheel	•••
Dimensioni cerchio		17 × MT3.50	•••
Rim material		Aluminium	•••
Rim runout limit	radial	•••	1.0 mm
	lateral	•••	0.5 mm
Rear wheel:			
Type		Cast wheel	•••
Rim size		17 × MT5.50	•••
Rim material		Aluminium	•••
Rim runout limit	radial	•••	1.0 mm
	lateral	•••	0.5 mm

Item		Standard	Limit
Front brake:			
Type		Dual disc	•••
Disc outside diameter × thickness		298 × 5 mm	4.5 mm
Disc deflection limit		•••	0.1 mm
Pad thickness	inner	4.5 mm	0.5 mm*
	outer	4.5 mm	0.5 mm*
			
Master cylinder inside diameter		15 mm	•••
Caliper cylinder inside diameter		30.2 mm	•••
Caliper cylinder inside diameter		27 mm	•••
Brake fluid type		DOT 4	•••
Rear brake:			
Type		Single disc	•••
Disc outside diameter × thickeness		267 × 5 mm	4.5 mm
Disc deflection limit		•••	0.15 mm
Pad thickness	inner	5.5 mm	0.5 mm
	outer	5.5 mm	0.5 mm
Master cylinder inside diameter		13 mm	•••
Caliper cylinder inside dimeter		42.85 mm	•••
Brake fluid type		DOT 4	
Brake pedal position		43 mm	•••
Clutch lever free play (at lever end)		5 ~ 10 mm	•••
Throttle grip free play		3 ~ 5 mm	•••

Tightening torques

Part to be tightened	Thread size	Tightening torque		Remarks
		N·m	m·kg	
Headlight assembly/Cowling:				
Lower headlight support	M6	10	1.0	
Upper headlight support (right and left)	M6	7	0.7	
Headlight bracket (right and left)	M6	10	1.0	
Plastic cover	M5	4	0.4	
Front flasher lights (right and left)	M12	10	1.0	
Handlebar/Front fork assembly:				
Upper bracket and inner tube	M8	25	2.5	
Lower bracket and inner tube	M8	25	2.5	
Front fork cap nut and steering shaft	M22	110	11.0	
Ring nut (steering shaft)	–	18	1.8	See “Note”
Meter bracket and upper bracket	M6	10	1.0	
Handlebar holder (lower) and upper bracket	M10	32	3.2	
Handlebar holder (lower) and handlebar (upper)	M8	23	2.3	
Throttle cable	M5	4.5	0.45	
Clutch lever assembly	M6	11	1.1	
Handlebar weight (right and left)	M8	25	2.5	
Front fender fastening screw	M6	7	0.7	
Front wheel:				
Front brake caliper (right and left)	M10	42	4.2	
Front brake disc (right and left)	M8	25	2.5	
Front wheel axle	M18	75	7.5	
Front wheel axle pinch bolt	M8	25	2.5	
Rear wheel:				
Rear brake disc	M8	25	2.5	
Rear brake caliper	M10	35	3.5	
Rear wheel axle nut	M16	110	11.0	
Rear wheel axle pinch bolt	M8	22	2.2	
Dust cover fastening screw	M5	4	0.4	
Swingarm assembly:				
Pivot shaft	M16	92	9.2	
Swingarm pinch bolt	M8	22	2.2	
Shock absorber fastener (upper)	M10	42	4.2	
Shock absorber fastener (lower)	M10	50	5.0	
Connecting arm	M12	50	5.0	
Relay arm	M10	50	5.0	
Final gear case fastening cap nut	M10	50	5.0	
Sidestand/Shift pedal:				
Sidestand	M8	19	1.9	
Sidestand switch	M5	4.5	0.45	
Shift rod	M6	7	0.7	
Ball-and-joint socket	M6	8	0.8	
Shift boss	M6	7	0.7	
Shift pedal	M8	16	1.6	
Front brake:				
Brake hose union bolt	M10	28	2.8	
Front master cylinder	M6	10	1.0	
Front master cylinder cover	–	2	0.2	
Front brake joint fastening screw	M6	10	1.0	
Brake hose holder fastening screw	M6	10	1.0	

Part to be tightened	Thread size	Tightening torque		Remarks
		N·m	m·kg	
Rear brake/Footrests:				
Brake caliper torque rod	M8	25	2.5	
Rear brake adjuster	M6	10	1.0	
Rear brake pedal fastening screw (special)	M8	16	1.6	
Rear master cylinder fastening screw	M6	10	1.0	
Rear brake fluid reservoir fastening screw	M6	7	0.7	
Special screw for fastening rear brake hose to brake caliper	M10	28	2.8	
Special screw for fastening rear brake hose to master cylinder	M10	25	2.5	
Brake caliper bleed screw	M6	5.5	0.55	
Front footrest bracket fastening screw (aluminium)	M10	55	5.5	
Front footrest bracket fastening screw (steel)	M8	23	2.3	
Footrest damper fastening screw	M5	4	0.4	
Rear footrest fastening screw	M6	7	0.7	
Rear footrest bracket fastening screw	M8	23	2.3	
Rear lights/Rear fender/Panel assembly:				
Side panel fastening screw	M6	7	0.7	
Battery receptacle fastening screws	M6	7	0.7	
Battery receptacle cover fastening screws	M6	7	0.7	
Plastic rear fender fastening screws	M6	7	0.7	
Plastic license bracket fastening screws	M6	7	0.7	
Rear fender cover fastening screw (aluminium)	M8	23	2.3	
Seat lock fastening screw	M6	7	0.7	
Rear flasher lights (right and left)	M12	10	1.0	
Tail light fastening screw	M6	7	0.7	
Fuel tank:				
Fastening screw (front)	M6	10	1.0	
Fastening screw (rear)	M6	10	1.0	
Bracket fastening screw (rear)	M6	7	0.7	
Tank cap fastening screw	M5	6	0.6	
Tank cover fastening screw (aluminium)	M5	4	0.4	
Fuel cock fastening screw	M6	7	0.7	
Fuel sender fastening screw	M6	7	0.7	

NOTE:

1. First, tighten the ring nut approximately 52 Nm (5.2 m·kg) by using the torque wrench, then loosen the ring nut completely.
2. Retighten the ring nut to specification.

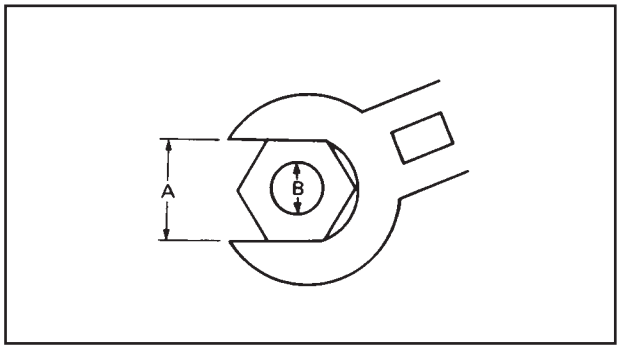
ELECTRICAL

Item	Standard	Limit
Voltage:	12 V	•••
Ignition system:		
Ignition timing (B.T.D.C.)	10° at 1,000 r/min	•••
Advancer type	Digital type	•••
T.C.I.:		
Pickup coil resistance/color	189 ~ 231 Ω at 20 °C / Gray–Black	•••
T.C.I. unit model/manufacturer	J4T157/MITSUBISHI	•••
Ignition coil:		
Model/manufacturer	F6T552/MITSUBISHI	•••
Primary winding resistance	3.57 ~ 4.83 Ω at 20 °C	•••
Secondary winding resistance	10.7 ~ 14.5 kΩ at 20 °C	•••
Spark plug cap:		
Type	Resin type	•••
Resistance	10 kΩ	•••
Charging system:		
Type	A.C. magneto	•••
Model/manufacturer	F4T654/MITSUBISHI	•••
Nominal output	14V 350W at 5,000 r/min	•••
Stator coil resistance/color	0.36 ~ 0.44 Ω at 20 °C / White–White	•••
Voltage regulator:		
Type	Semi-conductor, short-circuit type	•••
Model/manufacturer	SH650D-11/SHINDENGEN	•••
No load regulated voltage	14.1 ~ 14.9 V	•••
Rectifier:		
Model/manufacturer	SH650D-11/SHINDENGEN	•••
Capacity	18 A	•••
Withstand voltage	200 V	•••
Battery:		
Specific gravity	1.320	•••
Electric starter system:		
Type	Constant mesh type	•••
Starter motor:		
Model/manufacturer	SM-13/MITSUBA	•••
Output	0.6 kW	•••
Armature coil resistance	0.026 ~ 0.034 Ω at 20 °C	•••
Brush overall length	10 mm	5 mm
Brush spring pressure	7.65 ~ 10,01 N (780 ~ 1021 g)	•••
Commutator diameter	28 mm	27 mm
Mica undercut	0.7 mm	•••
Starter relay:		
Model/manufacturer	MS5F-421/JIDECO	•••
Amperage rating	180 A	•••
Resistance	4.18 ~ 4.62 Ω at 20 °C	•••

Item	Standard	Limit
Horn:		
Type	Plane type	•••
Quantity	1	•••
Model/manufacturer	K80 L-12V/LEB	•••
Maximum amperage	3 A	•••
Flasher relay:		
Type	Full transistor	•••
Model/manufacturer	FE218BH/DENSO	•••
Self cancelling device	No	•••
Hazard flasher device	Yes	•••
Flasher frequency	75 ~ 95 cycle/min	•••
Wattage	10 W × 2 + 3.4 W	•••
Oil level gauge:		
Model/manufacturer	5JN/DENSO	•••
Starting circuit cut-off relay:		
Model/manufacturer	G8R-30Y-U0/OMRON	•••
Coil resistance	162 ~ 198 Ω at 20 °C	•••
Throttle position sensor:		
Resistance	4.0 ~ 6.0 kΩ at 20 °C / Blue-Black	•••
Fuel pump relay:		
Model/manufacturer	G8R-30Y-U0/OMRON	•••
Coil resistance	162 ~ 198 Ω at 20 °C	•••
Thermostat switch:		
Model/manufacturer	5FU/NIPPON THERMOSTAT	
Circuit breaker:		
Circuit breaker type	Fuse	
Amperage for fuses:		
Main fuse	30 A	
Headlight fuse	15 A	
Signaling system fuse	10 A	
Ignition fuse	10 A	
Parking lighting fuse	10 A	
Odometer fuse (backup)	10 A	
Igniter fuse	5 A	
Carburetor heater fuse	15 A	
Reserve fuse	30 A	
Reserve fuse	15 A	
Reserve fuse	10 A	
Reserve fuse	5 A	

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until the specified torque is reached. Unless otherwise specified, torque specifications require clean, dry threads. Components should be at room temperature.



A: Distance between flats
B: Outside thread diameter

A (nut)	B (Bolt)	General torque specifications	
		N·m	m·kg
10 mm	6 mm	6	0.6
12 mm	8 mm	15	1.5
14 mm	10 mm	30	3.0
17 mm	12 mm	55	5.5
19 mm	14 mm	85	8.5
22 mm	16 mm	130	13.0

CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS. Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

METRIC		MULTIPLIER		IMP
** mm	×	0.03937	=	** in
2 mm	×	0.03937	=	0.08 in

CONVERSION TABLE

METRIC TO IMP			
	Known	Multiplier	Result
Torque	m·kg	7.233	ft·lb
	m·kg	86.794	in·lb
	cm·kg	0.0723	ft·lb
	cm·kg	0.8679	in·lb
Weight	kg	2.205	lb
	g	0.03527	oz
Distance	km/hr	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
Volume/ Capacity	cc (cm^3)	0.03527	oz (IMP liq.)
	cc (cm^3)	0.06102	cu·in
	lt (liter)	0.8799	qt (IMP liq.)
	lt (liter)	0.2199	gal (IMP liq.)
Miscel-laneous	kg/mm	55.997	lb/in
	kg/cm^2	14.2234	psi (lb/in^2)
	Centigrade	9/5 (°C) + 32	Fahrenheit (°F)

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE

Lubrication point	Symbol
Oil seal lips	LS
O-ring	LS
Bearing	E
Connecting rod bolt/nut	M
Connecting rod small end and big end	E
Crankshaft pin	E
Crankshaft journal/big end	E
Piston surface	E
Piston pin	E
Camshaft cam lobe/journal	M
Rocker arm shaft	E
Valve stem (IN, EX)	M
Valve stem end (IN, EX)	E
Timing chain drive gear shafts/sprokets	E
Oil pump rotor (inner/outer), housing	E
Idle gear surface	E
Starter idle gear	E
Starter idle gear shaft	E
Starter oneway cam	E
Middle drive gear	E
Primary driven gear	E
Push rod 1, 2	M
Transmission gear (wheel/pinion)	E
Shift cam	E
Shift fork/guide bar	E
Shift shaft assembly	E
Push rod ball	LS
Push lever assembly	LS

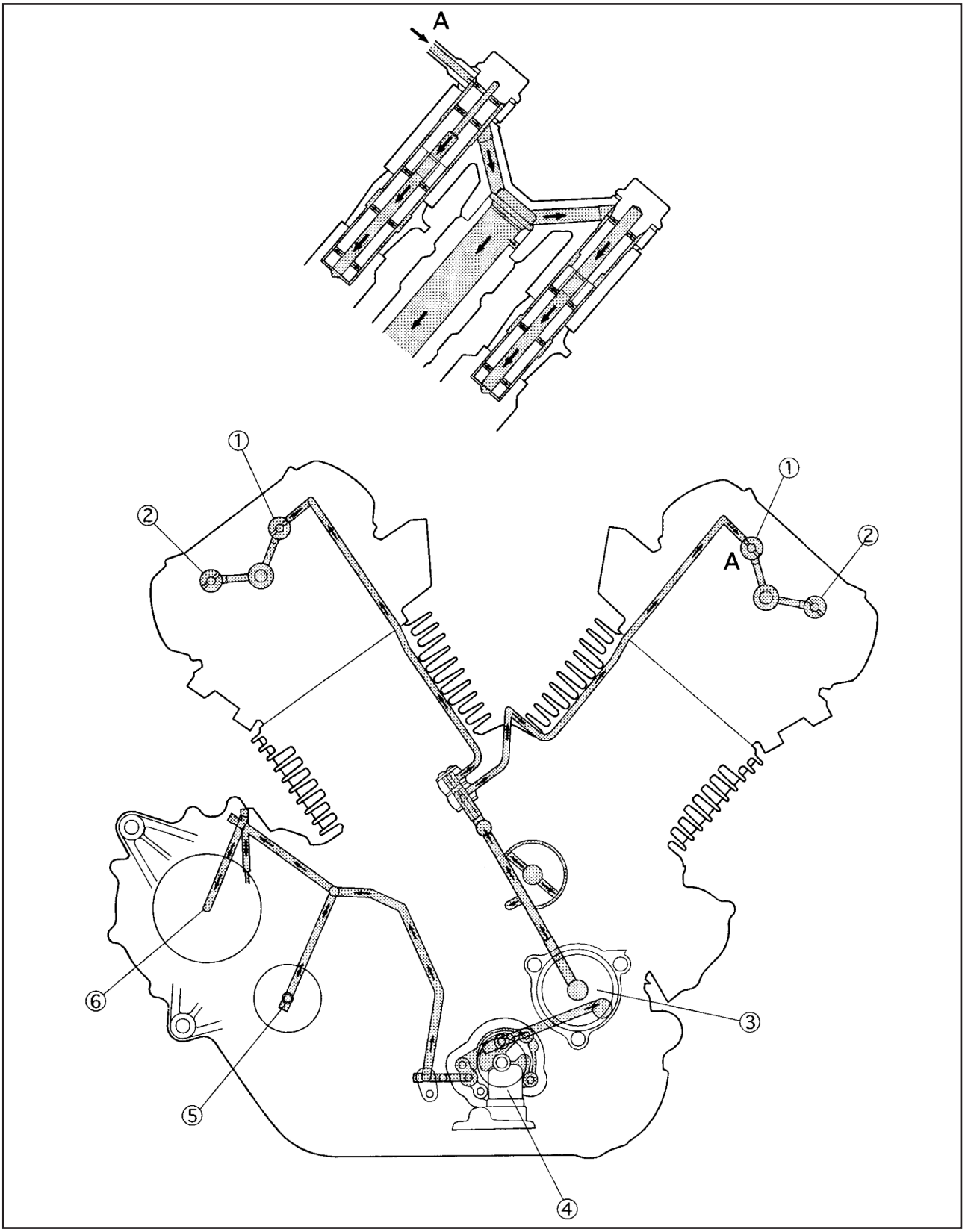
CHASSIS

Lubrication point	Symbol
Steering head pipe (upper/lower), bearing	LS
Steering head pipe, bearing cover lip	LS
Steering head pipe, oil seal lip	LS
Front wheel oil seal lip (right/left)	LS
Rear wheel oil seal lip	LS
Clutch hub fitting area	LS
Rear brake pedal shaft	LS
Shift pedal shaft	LS
Sidestand bolt, sidestand sliding surface	LS
Tube guide (throttle grip) inner surface	LS
Brake lever pivot bolt, contact surface	LS
Clutch lever pivot bolt, contact surface	LS
Rear shock absorber (lower) oil seal lip	M
Swingarm pivot bearing inner surface	M
Swingarm pivot oil seal lip	M
Relay arm bearing, collar and oil seal	M
Drive shaft spline	M
Drive shaft dust cover	LS
Drive shaft coupling gear oil seal	LS

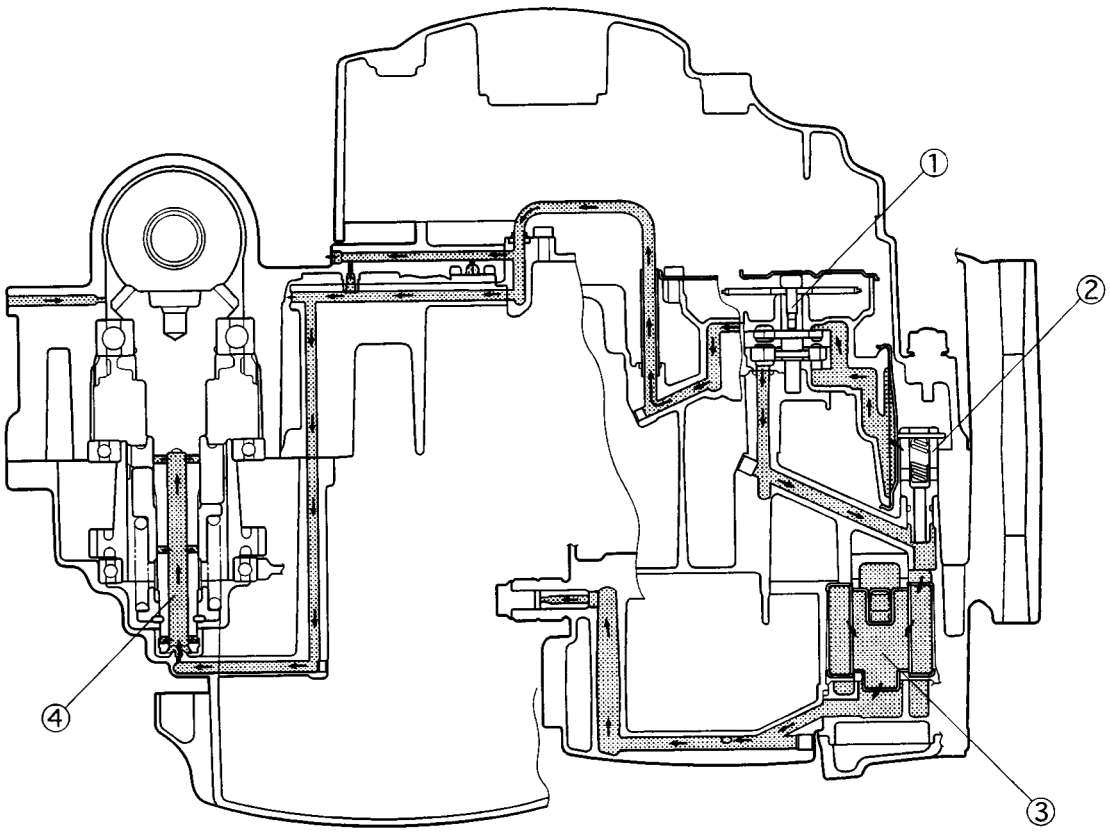
EB205000

LUBRICATION DIAGRAMS

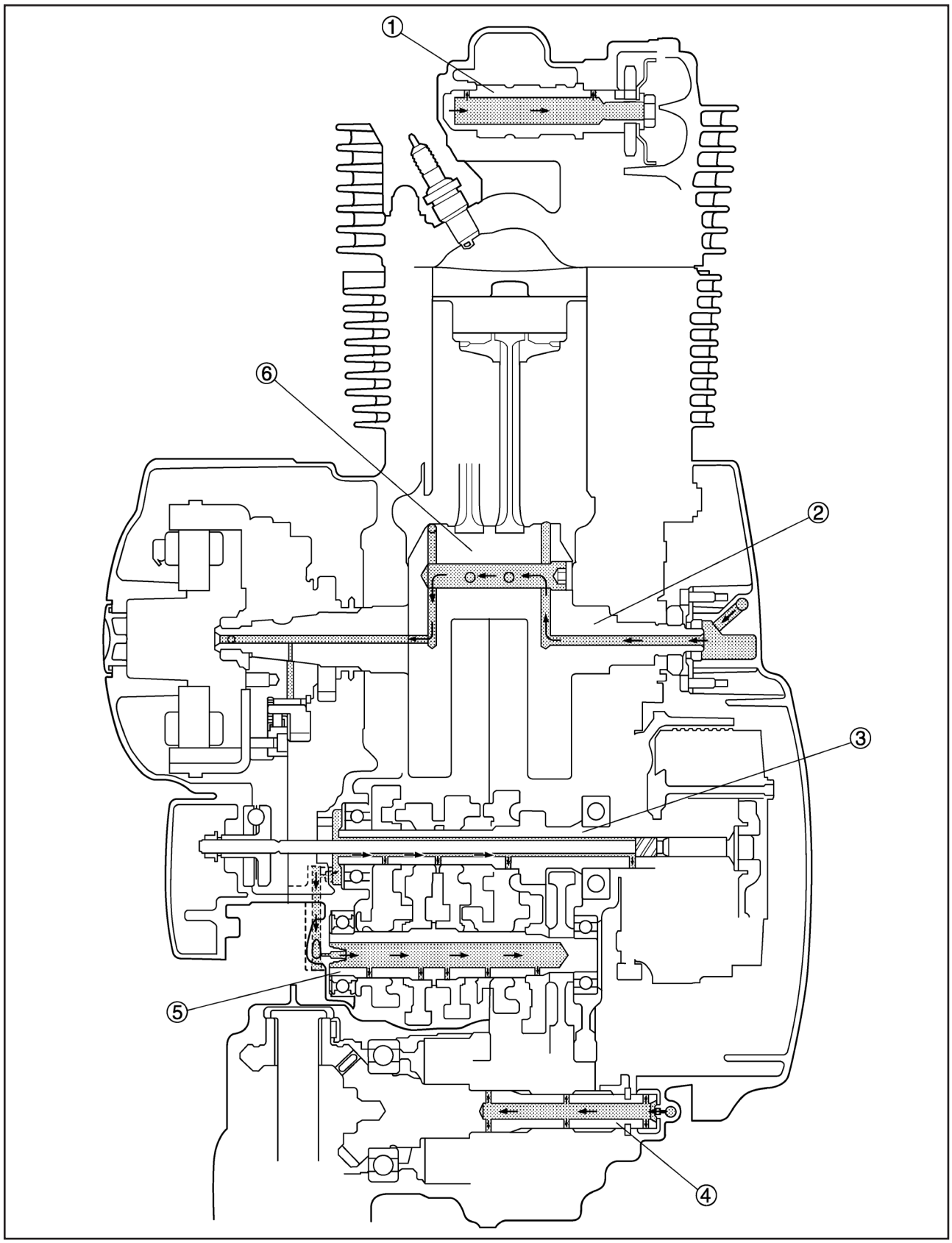
① Rocker arm shaft (intake)
② Rocker arm shaft (exhaust)
③ Oil filter
④ Oil pump
⑤ Drive axle
⑥ Middle drive shaft



① Oil pump
② Releaf valve
③ Oil filter
④ Middle drive shaft



① Camshaft
② Crankshaft
③ Main axle
④ Middle drive shaft
⑤ Drive axle
⑥ Connecting rod big end

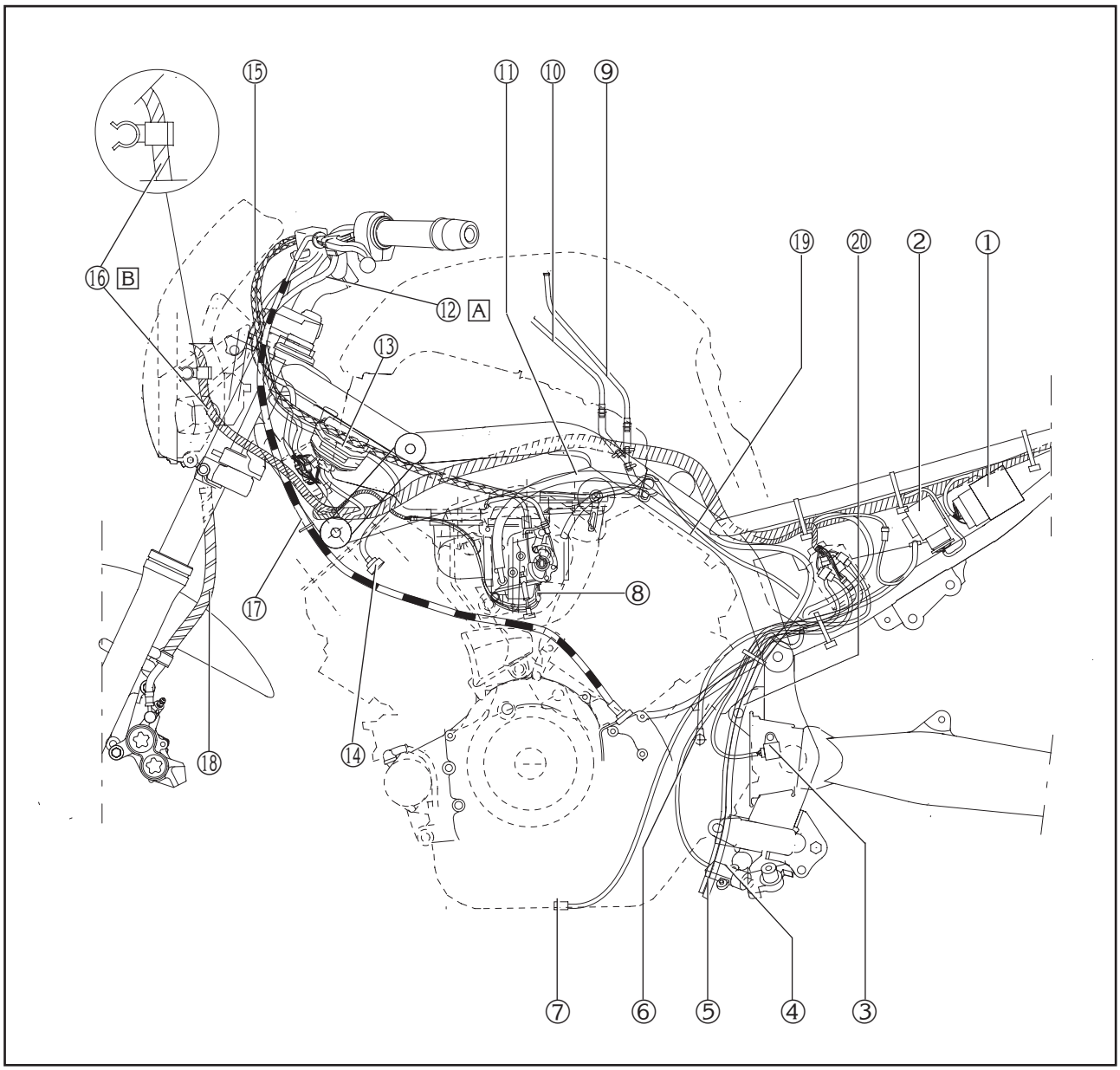


CABLE ROUTING

① Relays group
② Flasher relay
③ Speed sensor
④ Sidestand switch
⑤ Fuel drain hose
⑥ Engine earth
⑦ Neutral switch
⑧ Carburetor heater
⑨ Filler tank cap fuel drain pipe
⑩ Filler tank cap fuel drain pipe
⑪ Fuel hose (carburetor-3 way)
⑫ Handlebar switch leads (left)
⑬ Rectifier/regulator
⑭ Spark plug cap (front cilinder)
⑮ Throttle cables
⑯ Wireharness
⑰ Clutch cable
⑱ Front brake cable (left)
⑲ Carburetor pipe vent
⑳ Pipe drain

[A] Fix the wires of the left swicth assy to the handlebar by means of no. 2 plastic clamps.

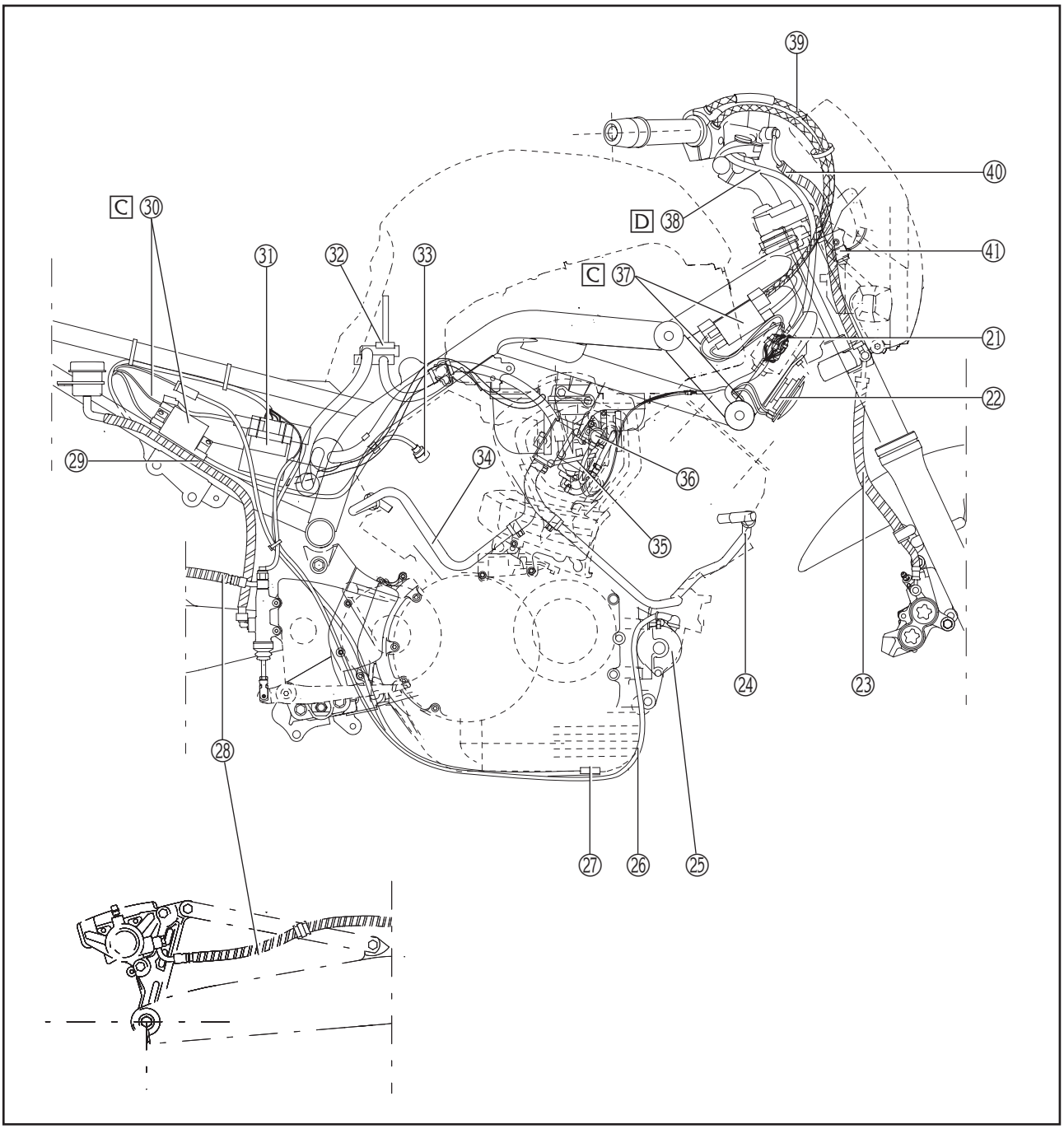
[B] Fix the headlight leads to the clamp.



㉑ Rubber cap for front wiring connections
㉒ Horn
㉓ Front brake hose (right)
㉔ A.I.S. pipe to the front cylinder
㉕ Starter motor
㉖ Starter motor lead
㉗ Oil level gauge
㉘ Rear brake hose
㉙ Brake fluid reservoir hose
㉚ Ignition coil (rear cylinder)
㉛ Starter relay assy
㉜ Depression fuel cock
㉝ Spark plug cap (rear cylinder)
㉞ A.I.S. pipe to the rear cylinder
㉟ A.I.S. system
㊱ Throttle position sensor (TPS)
㊲ Ignition coil (front cylinder)
㊳ Handlebar switch leads (right)
㊴ Throttle cables
㊵ Brake cable (front master cylinder)
㊶ Thermo swicth

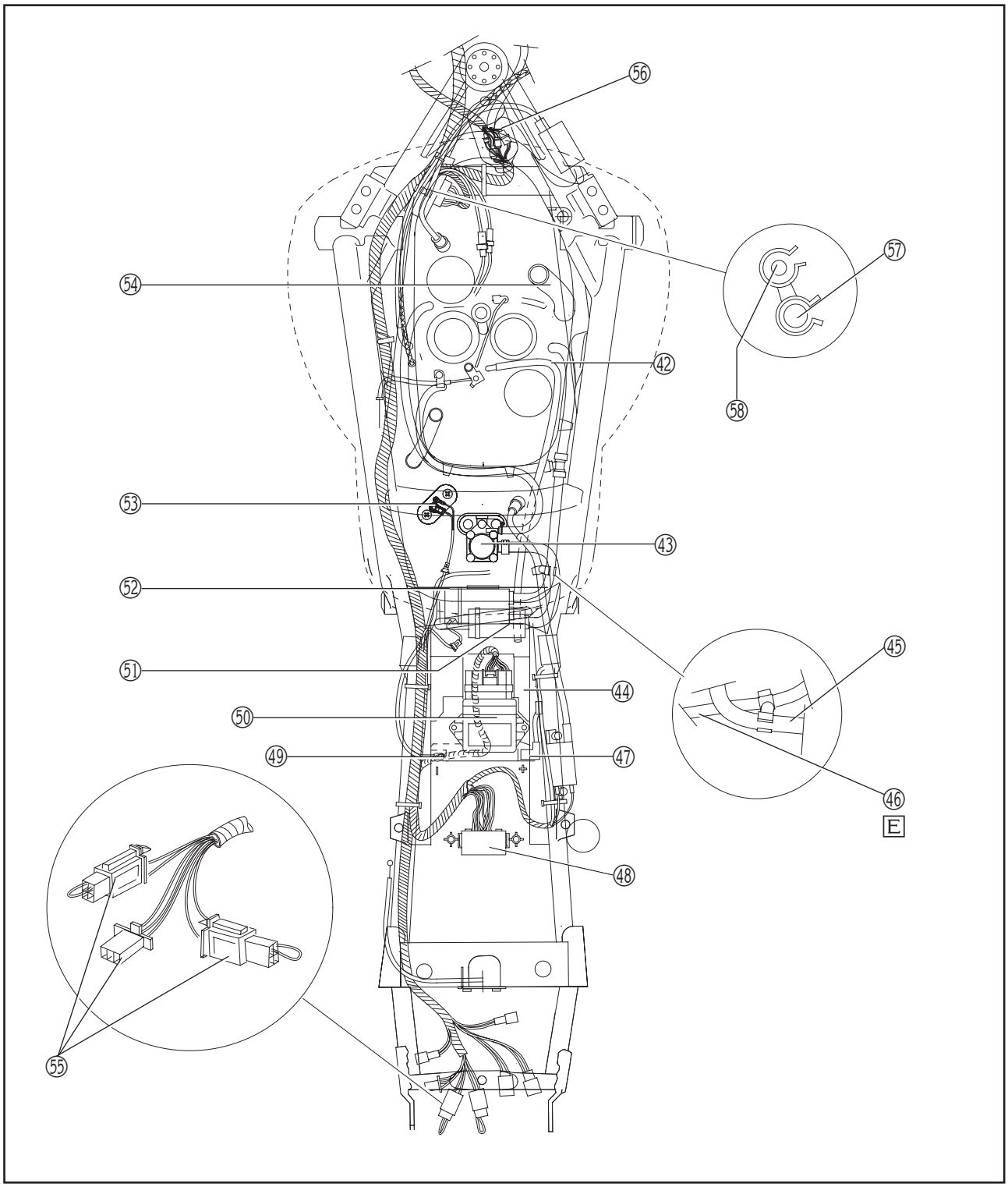
C Check that the wires of the ignition coil do not remain tensioned.

D Fix the wires of the right switch assy to the handlebar by means of no. 1 plastic clamp.



㊷ Carburetor pipe vent
㊸ Depression fuel cock
㊹ Battery
㊺ Fuel hose
㊻ Spark plug lead (rear)
㊼ Battery positive (+) terminal
㊽ Fuse box
㊾ Battery negative (-) terminal
㊿ Igniter unit
(51) Fuel filter
(52) Fuel pump
(53) Fuel sender
(54) Air intake pipe (A.I.S. system)
(55) Anti-theft alarm connectors
(56) Rubber cap for front wiring connections
(57) Spark plug lead (front)
(58) Throttle cable

[E] Position the spark plug wire of the rear cylinder below the fuel hose.



PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

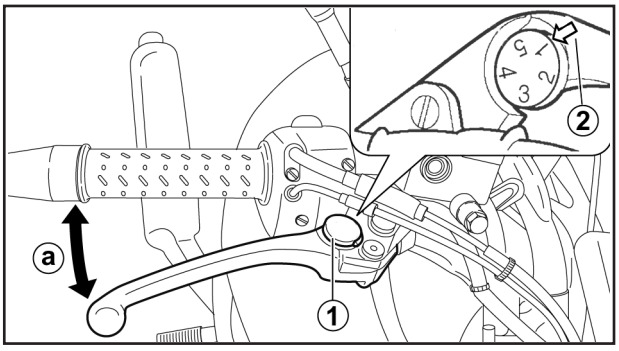
N0.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (x 1,000 km)					Annual check
				1	10	20	30	40	
1	*	Fuel line	• Check fuel hoses and vacuum hose for cracks or damage.		✓	✓	✓	✓	✓
2	*	Fuel filter	• Check condition.			✓		✓	
3		Spark plugs	• Check condition. • Clean and regap.		✓		✓		
			• Replace.			✓		✓	
4	*	Valves	• Check valve clearance. • Adjust.		✓	✓	✓	✓	
5		Air filter element	• Clean.		✓		✓		
			• Replace.			✓		✓	
6		Clutch	• Check operation. • Adjust.	✓	✓	✓	✓	✓	
7	*	Front brake	• Check operation, fluid level and vehicle for fluid leakage.	✓	✓	✓	✓	✓	✓
			• Replace brake pads.	Whenever worm to the limit					
8	*	Rear brake	• Check operation, fluid level and vehicle for fluid leakage.	✓	✓	✓	✓	✓	✓
			• Replace brake pads.	Whenever worm to the limit					
9	*	Brake hoses	• Check for cracks or damage.		✓	✓	✓	✓	✓
			• Replace.	Every 4 years					
10	*	Wheels	• Check runout and for damage.		✓	✓	✓	✓	
11	*	Tires	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		✓	✓	✓	✓	✓
12	*	Wheel bearings	• Check bearing for looseness or damage.		✓	✓	✓	✓	
13	*	Swingarm	• Check operation and for excessive play.		✓	✓	✓	✓	
			• Lubrificate with lithium-soap-based grease.	Every 50,000 km					
14	*	Steering bearings	• Check bearing play and steering for roughness.	✓	✓	✓	✓	✓	
			• Lubrificate with lithium-soap-based grease.	Every 20,000 km					
15	*	Chassis fasteners	• Make sure that all nuts, bolts and screws are properly tightened.		✓	✓	✓	✓	✓
16		Sidestand	• Check operation. • Lubricate.		✓	✓	✓	✓	✓
17	*	Sidestand Switch	• Check operation and for oil leakage.	✓	✓	✓	✓	✓	✓
18	*	Front fork	• Check operation and for oil leakage.		✓	✓	✓	✓	
19	*	Rear shock absorber assembly	• Check operation and shock absorber for oil leakage.		✓	✓	✓	✓	

N0.		ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (x 1,000 km)					Annual check
				1	10	20	30	40	
20	*	Rear suspension relay arm and connecting arm pivoting points	• Check operation.		✓	✓	✓	✓	
			• Lubricate with lithium-soap-based grease.			✓		✓	
21	*	Carburators	• Check starter (choke) operation. • Adjust engine idling speed and synchronization.	✓	✓	✓	✓	✓	✓
22		Engine oil	• Change. • Check oil level and vehicle for oil leakage.	✓	✓	✓	✓	✓	✓
23		Engine oil filter element	• Replace.	✓		✓		✓	
24		Final gear oil	• Check oil level and vehicle for oil leakage.	✓	✓		✓		
			• Change.	✓		✓		✓	
25	*	Front and rear brake switch	• Check operation.	✓	✓	✓	✓	✓	✓
26		Moving parts and cables	• Lubricate.		✓	✓	✓	✓	✓
27	*	Throttle grip housing and cable	• Check operation and free play. • Adjust the throttle cable free play if necessary. • Lubricate the throttle grip housing and cable.		✓	✓	✓	✓	✓
28	*	Air induction system	• Check the air cut valve, reed valve and hose for damage. • Replace the entire air induction system if necessary.		✓	✓	✓	✓	✓
29	*	Muffler and exhaust pipe	• Check the screw clamp for looseness.	✓	✓	✓	✓	✓	
30	*	Lights, signals and switches	• Check operation. • Adjust headlight beam.	✓	✓	✓	✓	✓	✓

* Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

NOTE:

- The annual checks must be performed every year, except if a kilometer-based maintenance is performed instead.
- From 50,000 km, repeat the maintenance intervals starting from 10,000 km.
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake system:
  - Check the brake fluid level regularly and fill as required.
  - Replace the oil seals on the inner parts of the master cylinder and caliper cylinder every two years.
  - Replace the brake hoses every four years or if cracked or damaged.



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CHASSIS

ADJUSTING THE FRONT BRAKE

1. Adjust:
   - brake lever position
     (distance ⓐ between the brake lever and the handlebar grip)

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a. Turn the adjusting dial ① while holding the lever pushed away from the handlebar grip

NOTE:

Align the setting on the adjusting dial with the arrow mark ②

Position n. 1	**Maximum ⓐ distance**
Position n. 5	**Minimum ⓐ distance**

⚠ WARNING

After adjusting the brake lever position, make sure the pin on the brake lever holder is firmly inserted in the hole in the adjusting dial.

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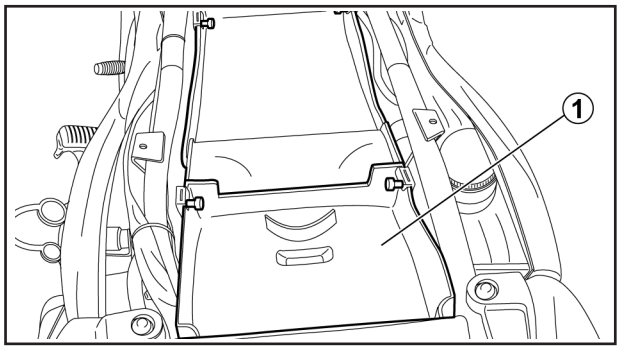
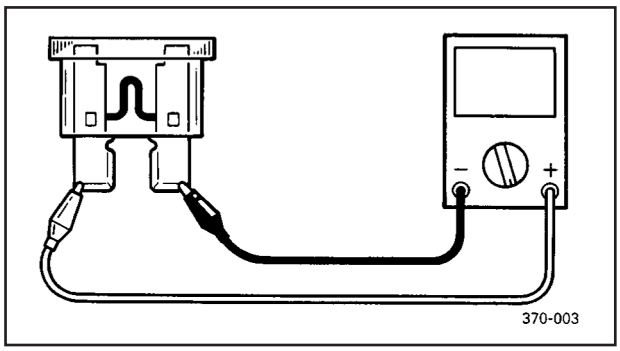
⚠ WARNING

A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance and could result in loss of control and possibly an accident. Therefore, inspect and, if necessary, bleed the brake system. After adjusting the brake lever free play, make sure that there is no brake drag.





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CHECKING THE FUSES

The following procedure applies to all of the fuses.

CAUTION:

To avoid a short circuit, always turn the main switch to "OFF" when checking or replacing a fuse.

1. Remove:
   - seat
   - storage compartment ①
2. Check:
   - fuse

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a. Connect the pocket tester to the fuse and check it for continuity.

NOTE:

Set the pocket tester selector to "Ω × 1".

Pocket tester
90890-03112

b. If the pocket tester indicates "∞", replace the fuse.

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3. Replace:
   - blown fuse

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a. Turn off the ignition.
b. Install a new fuse of the correct amperage rating.
c. Turn on the switches to verify if the electrical circuit is operational.
d. If the fuse immediately blows again, check the electrical circuit.

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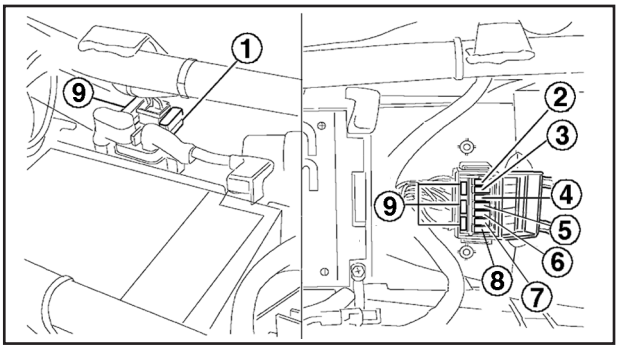


Fuses	Amperage rating	Quantity
① Main fuse	30 A	1
② Carburetor heater fuse	15 A	1
③ Headlight fuse	15 A	1
④ Signaling system fuse	10 A	1
⑤ Ignition fuse	10 A	1
⑥ Odometer fuse (backup)	10 A	1
⑦ Parking lighting fuse	10 A	1
⑧ Igniter fuse	5 A	1
⑨ Reserve fuse	30 A	1
⑩ Reserve fuse	15 A	1
⑪ Reserve fuse	10 A	1
⑫ Reserve fuse	5 A	1

⚠ WARNING

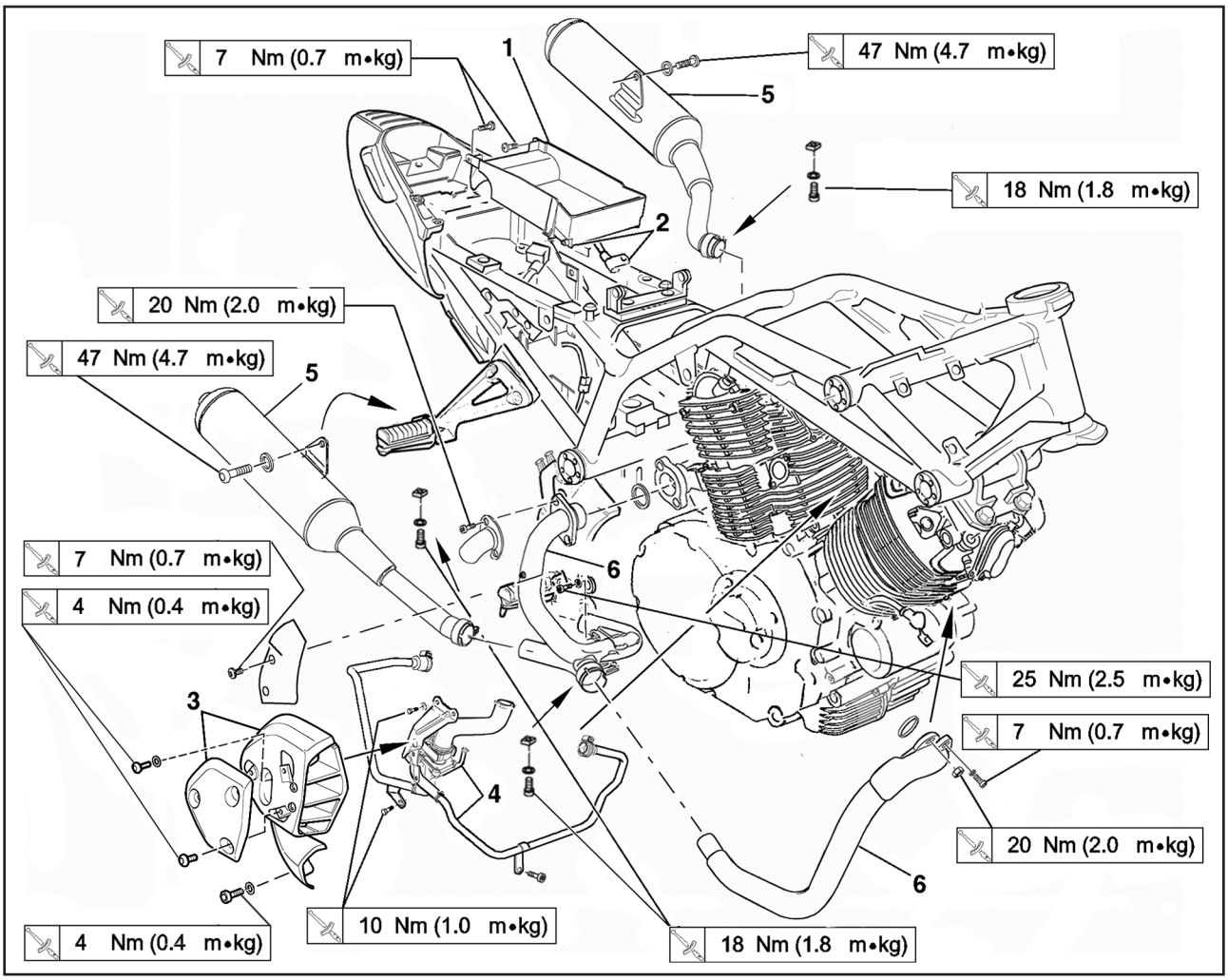
Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

4. Install:
   - storage compartment
   - seat

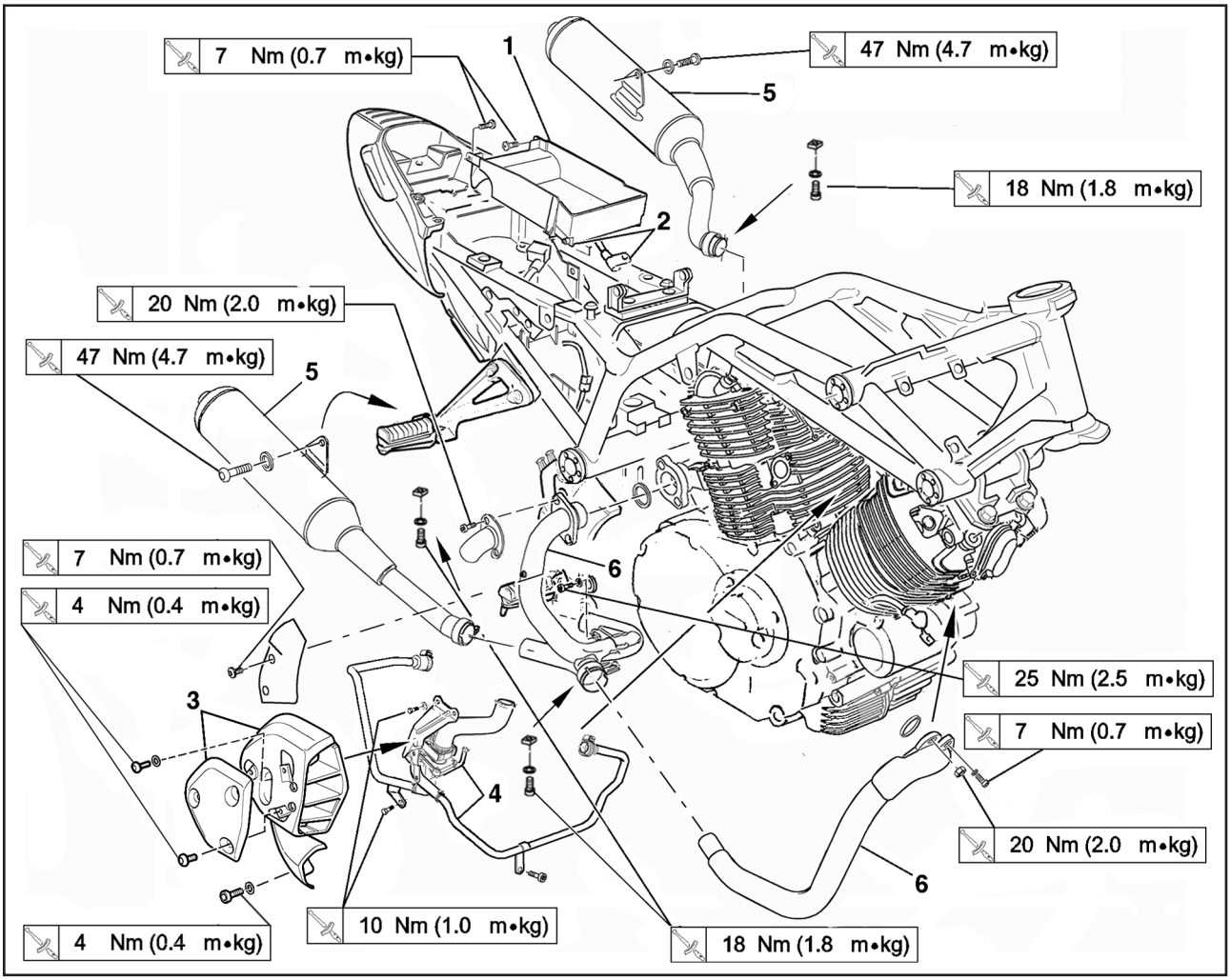
ENGINE

ENGINE REMOVAL

SEAT, STORAGE COMPARTMENT, SIDE COVERS, FUEL TANK, AIR FILTER CASE ASSEMBLY, CARBURETOR ASSEMBLY AND EXHAUST SYSTEM



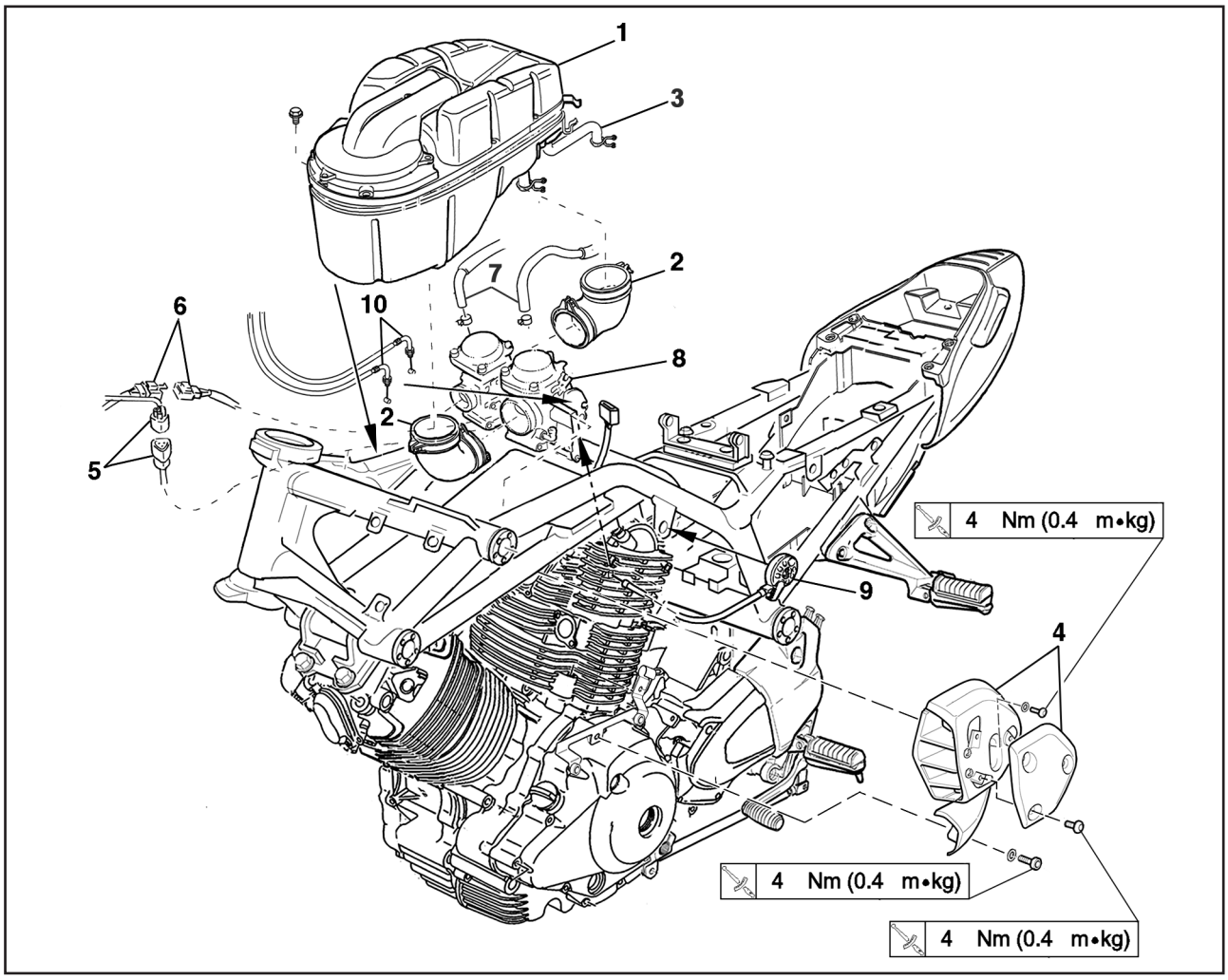
Order	Job name/Part name	Q'ty	Remarks
	Removing the seat, storage compartment, side covers, fuel tank, air filter case assembly, carburetor assembly and exhaust system		Remove the parts in the order listed. Stand the motorcycle on a level surface. **⚠ WARNING** **Securely support the motorcycle so there is no danger of it falling over.**
	Seat		
1	Storage compartment	1	



Order	Job name/Part name	Q'ty	Remarks
2	Battery leads	2	Disconnect **NOTE:** First, disconnect the negative lead, then disconnect the positive lead.
	Side covers Fuel tank		Refer to "SEAT, SIDE COVERS AND FUEL TANK" in Chapter 3.
	Air filter case assembly Carburetor assembly		Refer to "CARBURETOR" in Chapter 5.
3	A.I.S. system cover	1	
4	A.I.S. system	1	
5	Muffler assembly	2	
6	Exhaust pipes	2	For installation, reverse the removal procedure.

CARBURETION

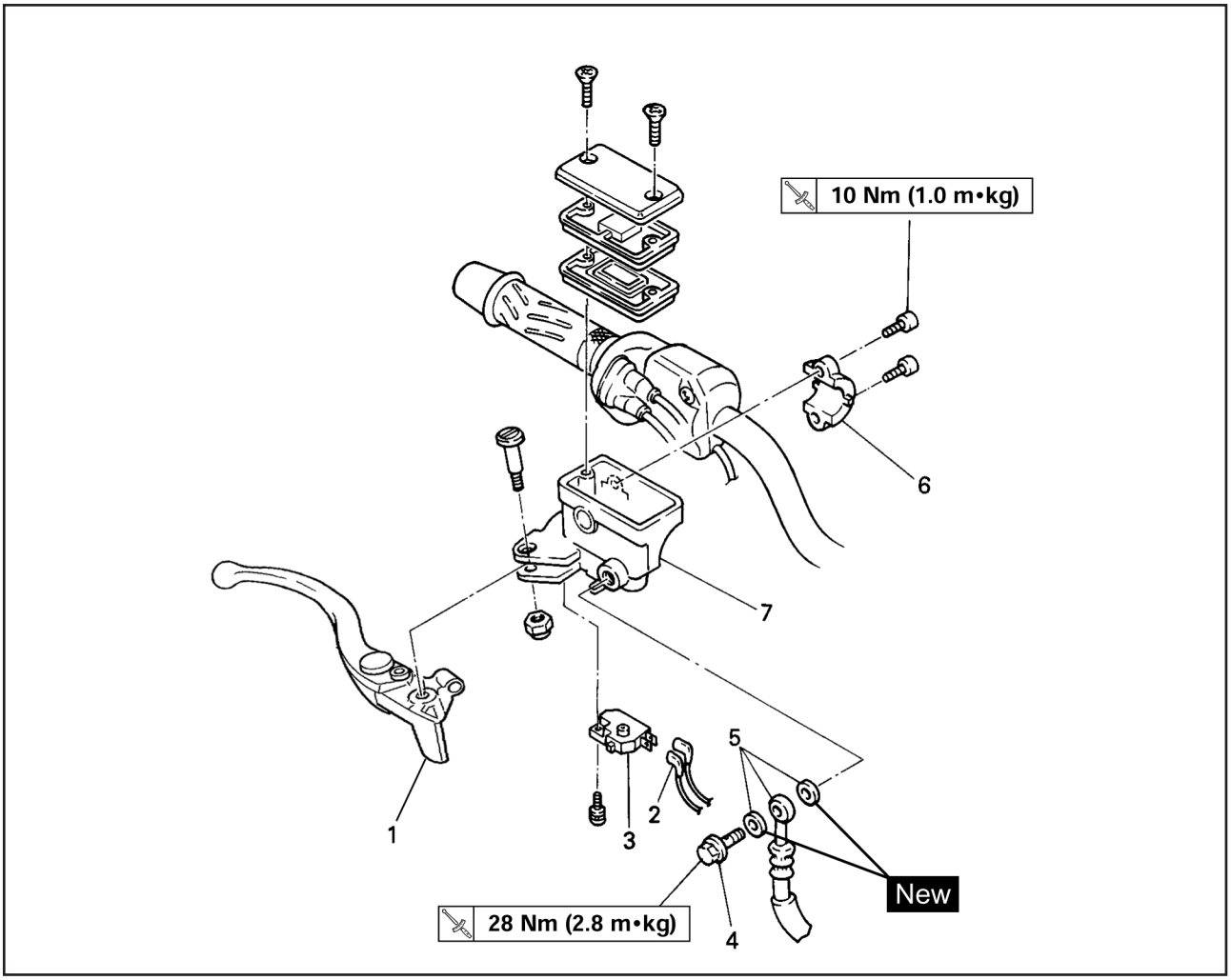
CARBURETOR



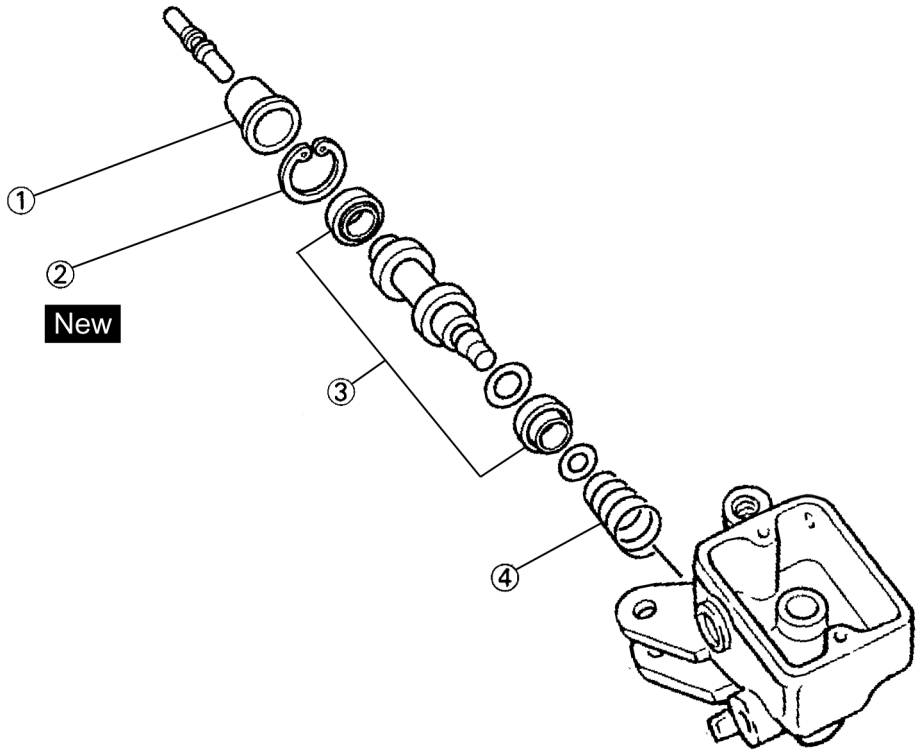
Order	Job name/Part name	Q'ty	Remarks
	Removing the carburetors		Remove the parts in the order listed.
	Seat		Refer to "SEAT, SIDE COVERS AND FUEL TANK" in Chapter 3.
	Fuel tank		
1	Air filter case assembly	1	
2	Air ducts	2	
3	Cylinder head breather hose	1	Disconnect
4	Cover	1	
5	Throttle position sensor lead	1	Disconnect
6	Carburetor heater lead	1	Disconnect
7	Fuel hoses	2	Disconnect
8	Carburetor assembly	1	
9	Starter cable	1	**NOTE:**
10	Throttle cables	2	After removing the carburetor assembly, remove the starter cable and throttle cables.
			For installation, reverse the removal procedure.

CHASSIS

FRONT BRAKE MASTER CYLINDER

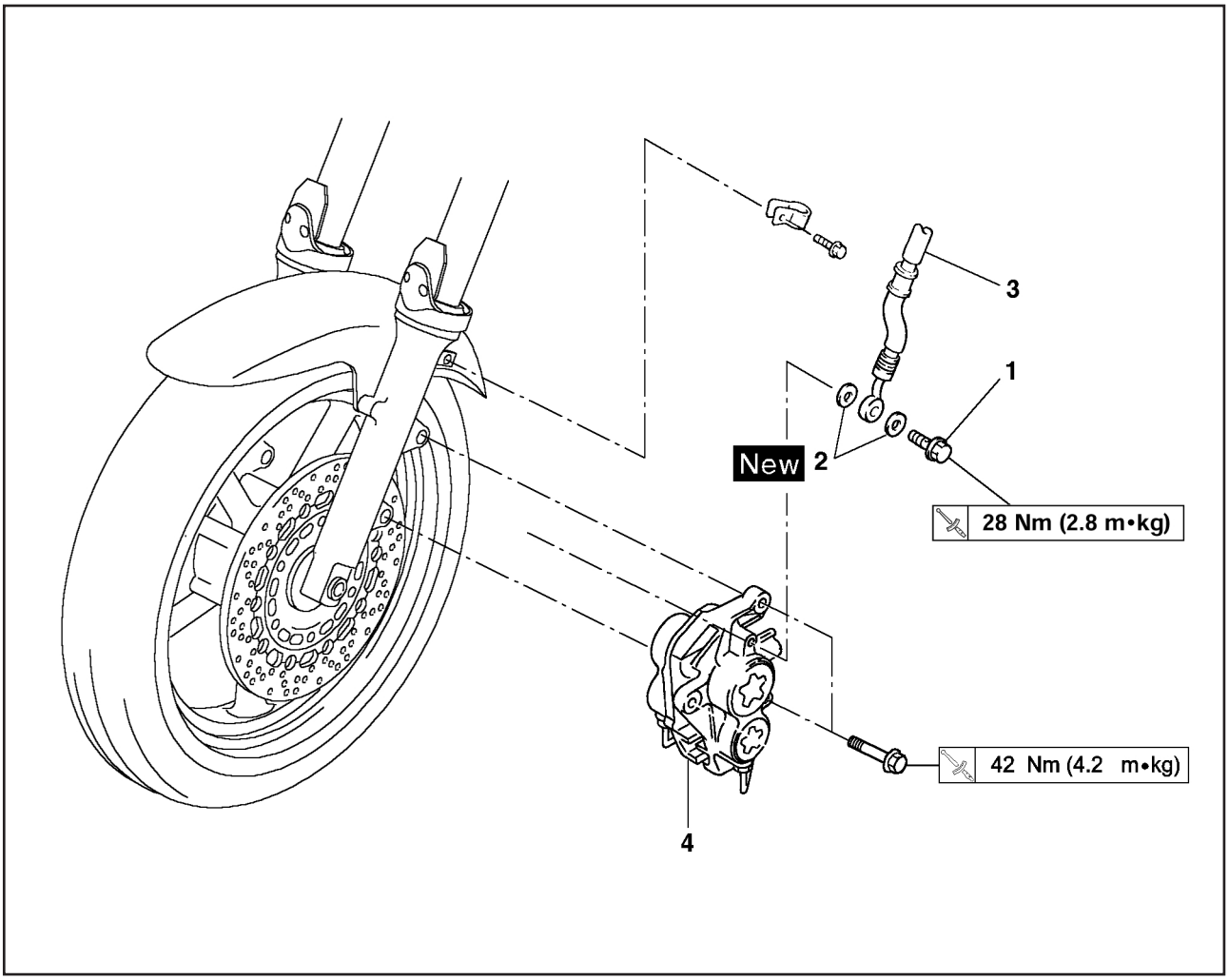


Order	Job name/Part name	Q'ty	Remarks
	Removing the front brake master cylinder		Remove the parts in the order listed.
	Drain the brake fluid		
1	Brake lever	1	
2	Front brake switch lead	2	
3	Front brake switch	1	
4	Union bolt	1	Refer to "REMOVING/INSTALLING THE FRONT BRAKE MASTER CYLINDER".
5	Copper washers/brake hose	2/1	
6	Master cylinder bracket	1	
7	Master cylinder	1	
			For installation, reverse the removal procedure.

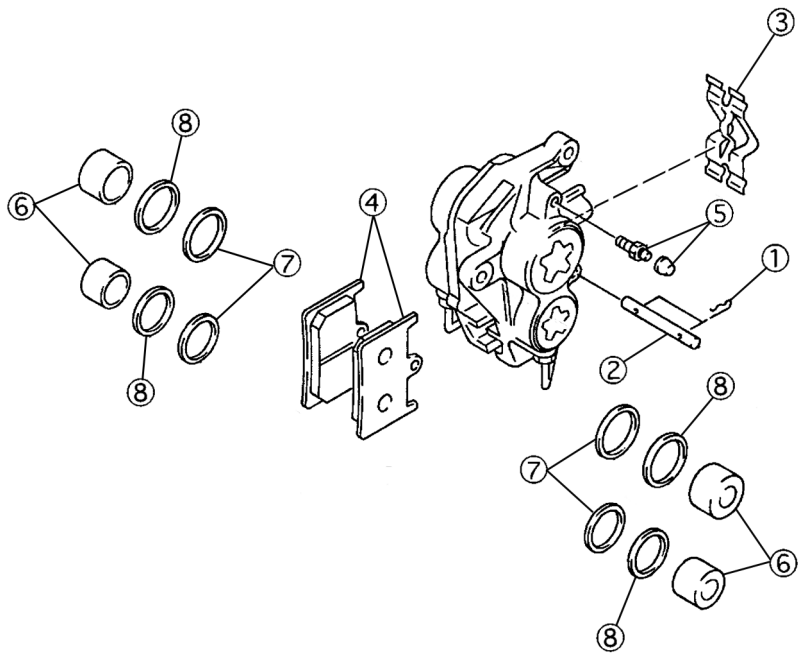


Order	Job name/Part name	Q'ty	Remarks
	Disassembling the front brake master cylinder		Remove the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Master cylinder cup	1	
④	Spring	1	
			For assembly, reverse the disassembly procedure.

FRONT BRAKE CALIPERS

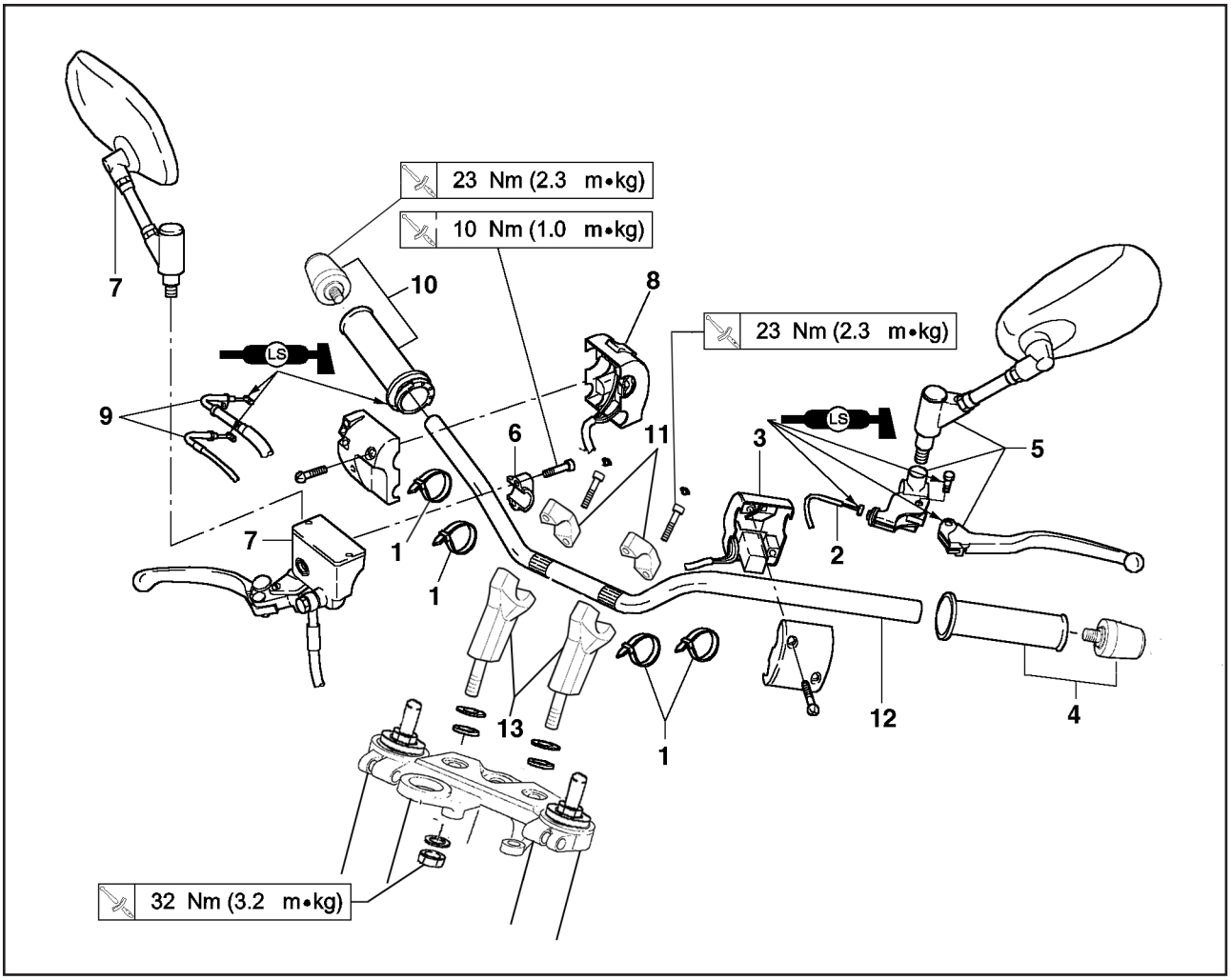


Order	Job name/Part name	Q'ty	Remarks
	Removing the front brake calipers		Remove the parts in the order listed.
	Drain the brake fluid		
1	Union bolt	1	Refer to "REMOVING/INSTALLING THE FRONT BRAKE CALIPERS".
2	Copper washers	2	
3	Brake hose	1	
4	Brake caliper assembly	1	
			For installation, reverse the removal procedure.

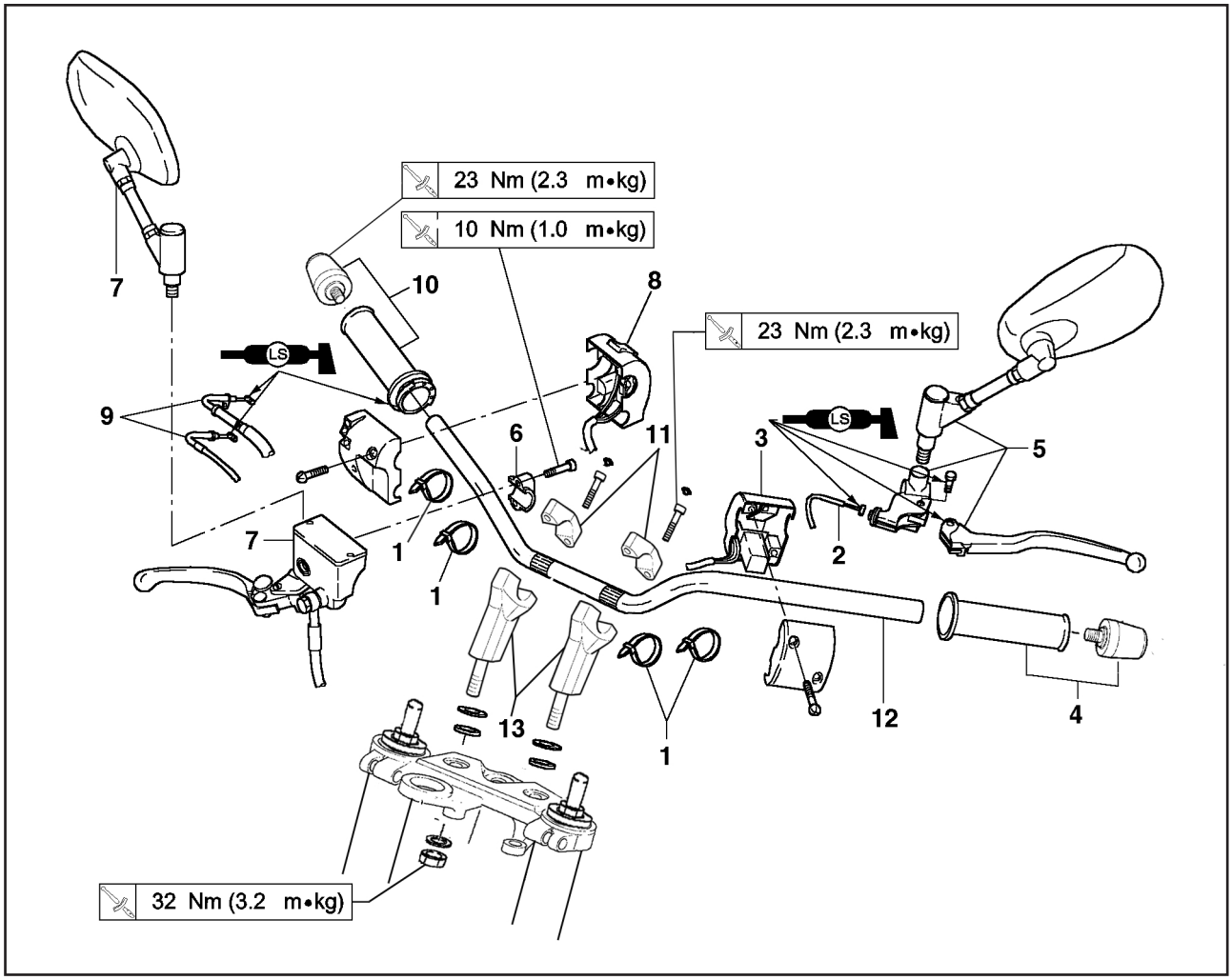


Order	Job name/Part name	Q'ty	Remarks
	Disassembling the front brake calipers		Remove the parts in the order listed.
①	Pad pin clips	2	Refer to "REPLACING THE FRONT BRAKE PADS".
②	Pad pin	1	
③	Pad spring	1	
④	Brake pads	2	
⑤	Bleed screw	1	
⑥	Brake caliper pistons	4	Refer to "DISASSEMBLING THE FRONT BRAKE CALIPER".
⑦	Dust seals	4	
⑧	Caliper piston seals	4	
			For assembly, reverse the disassembly procedure.

HANDLEBAR



Order	Job name/Part name	Q'ty	Remarks
	Removing the handlebar		Remove the parts in the order listed. Stand the motorcycle on a level surface. **⚠ WARNING** **Securely support the motorcycle so that there is no danger of it falling over.**
1	Plastic locking ties	2/2	
2	Clutch cable	1	
3	Handlebar switch (left)	1	Refer to "INSTALLING THE HANDLEBAR".
4	Grip (left)	1	Refer to "REMOVING THE HANDLEBAR".
5	Clutch lever assembly/rear view mirror	1/1	Refer to "INSTALLING THE HANDLEBAR".
6	Master cylinder bracket	1	
7	Master cylinder assembly/rear view mirror	1/1	
8	Handlebar switch (right)	1	
9	Throttle cables	2	



Order	Job name/Part name	Q'ty	Remarks
10	Throttle grip assembly	1	Refer to "INSTALLING THE HANDLEBAR".
11	Handlebar holders (upper)	2	
12	Handlebar	1	
13	Handlebar holders (lower)	2	
			For installation, reverse the removal procedure.

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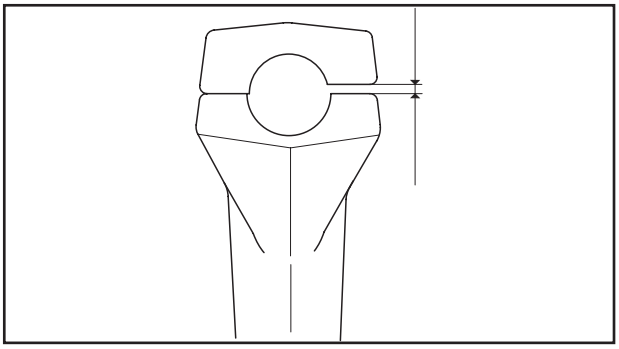
INSTALLING THE HANDLEBAR

1. Stand the motorcycle on a level surface.

⚠ WARNING

Securely support the motorcycle so that there is no danger of it falling over.

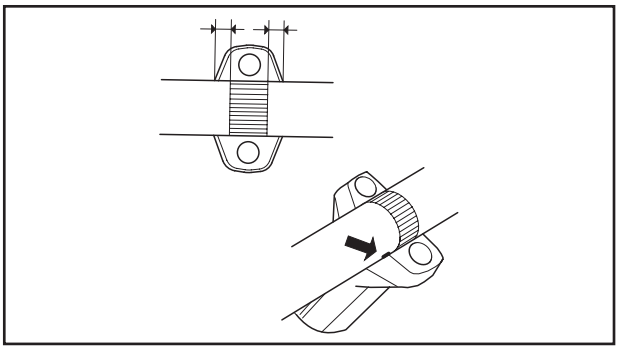


2. Install:
   - handlebar
   - upper handlebar holders

23 Nm (2.3 m•kg)

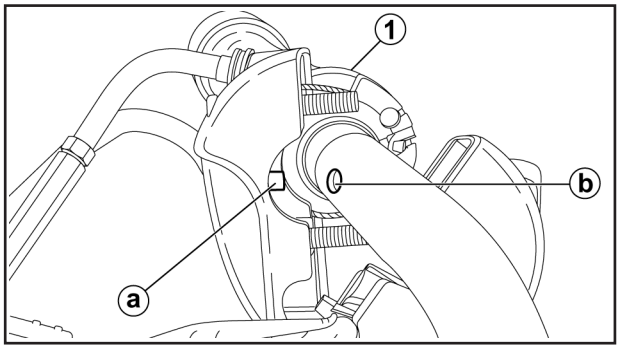
CAUTION:

- **First, tighten the bolts on the front side of the handlebar holder, then on the rear side.**
- **Turn the handlebar all the way to the left and right. If there is any contact with the fuel tank, adjust the handlebar position.**



NOTE:

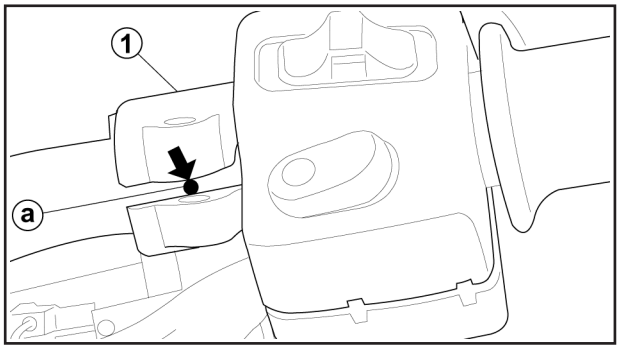
Align the match marks on the handlebar with the upper surface of the lower handlebar holders.



3. Install:
   - throttle grip ①
   - throttle cable

⚠ WARNING

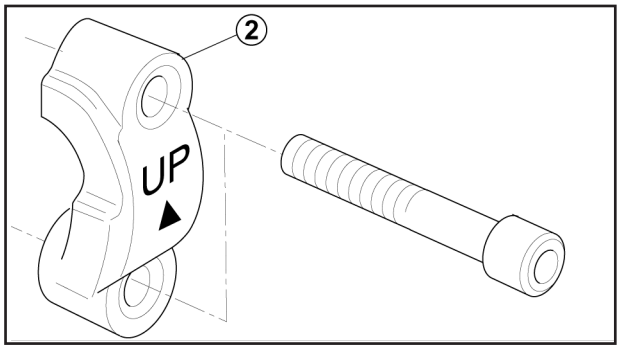
Make sure that the pin ⓐ on the throttle cable housing is aligned with the hole ⓑ in the handlebar.

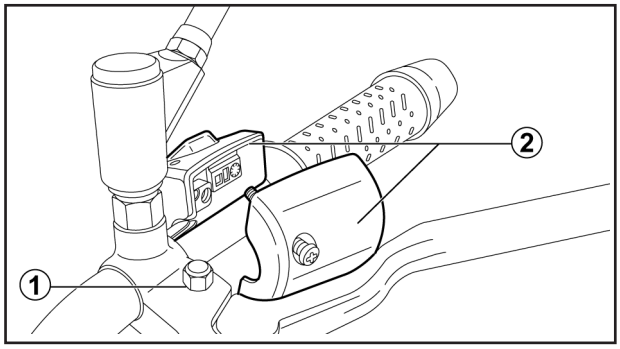


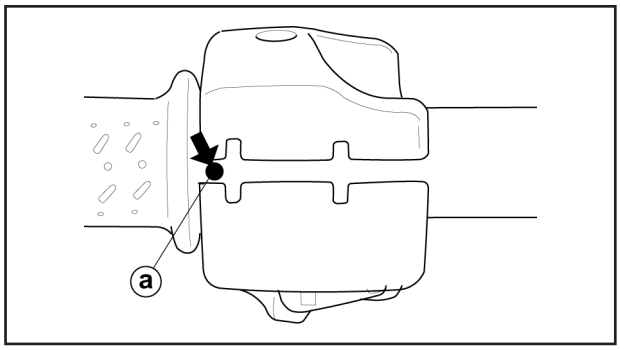
4. Install:
   - master cylinder ①
     Refer to “FRONT AND REAR BRAKES”.

NOTE:

Align the slit in the brake lever holder with the punch mark ⓐ in the handlebar.







5. Install:
   • master cylinder holder ②

10 Nm (1.0 m•kg)

NOTE:
Install the master cylinder holder ② with the mark "UP" facing up.

6. Install:
   • clutch lever holder ①

NOTE:
Align the slit in the clutch lever ⓐ holder with the punch mark in the handlebar.

7. Install:
   • left handlebar switch ②

NOTE:
Aligh the matching surface on the handlebar switches with the punch mark ⓐ on the handlebar.

8. Install:
   • clutch cable
9. Connect:
   • clutch switch coupler

NOTE:
Apply a thin coat of lithium soap base grease onto the end of the clutch cable.

10. Adjust:
    • clutch cable free play
      Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” in Chapter 3.

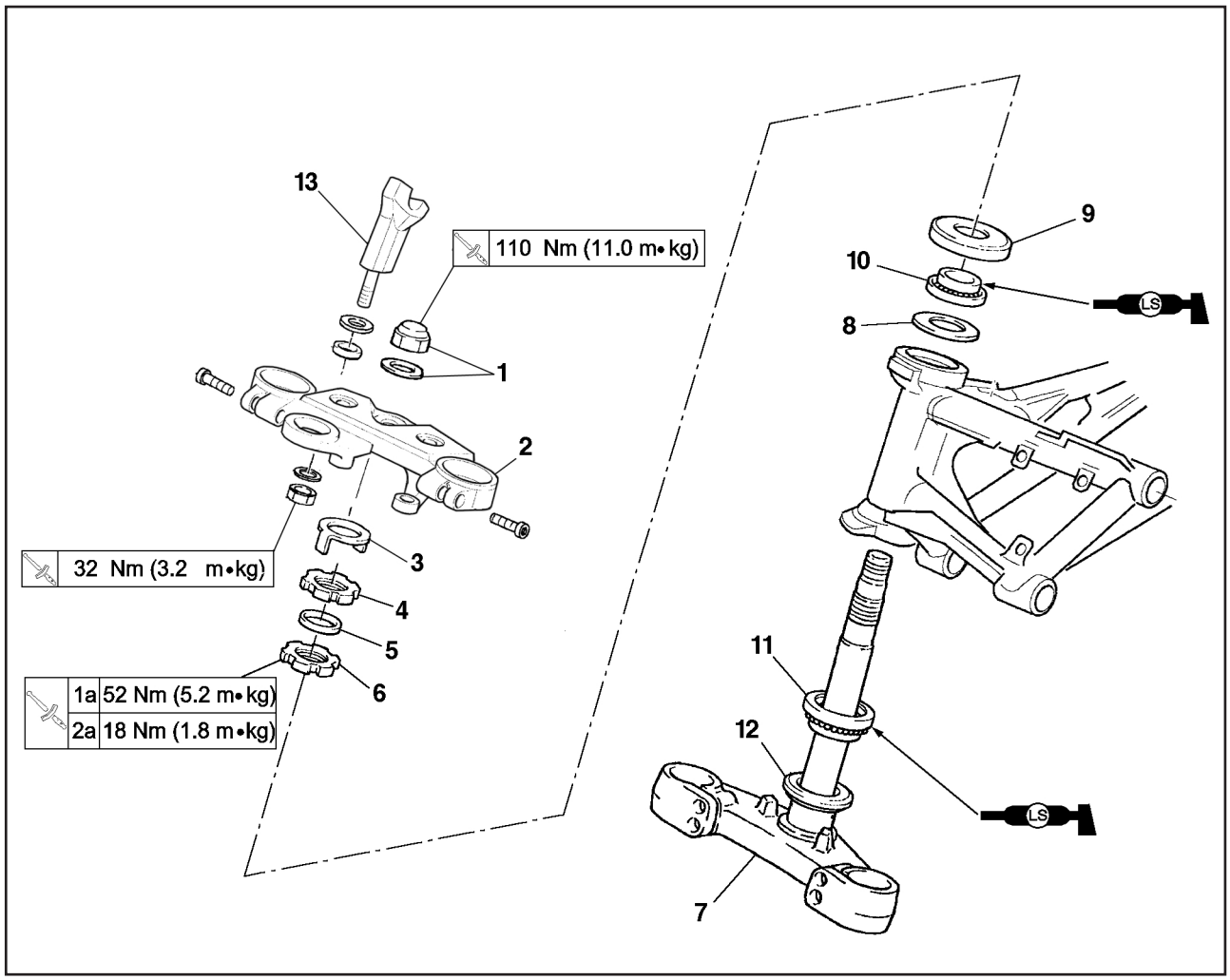
Clutch cable free play (at the end of the clutch lever)
5 ~ 10 mm

11. Adjust:
    • throttle cable free play
      Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” in Chapter 3.

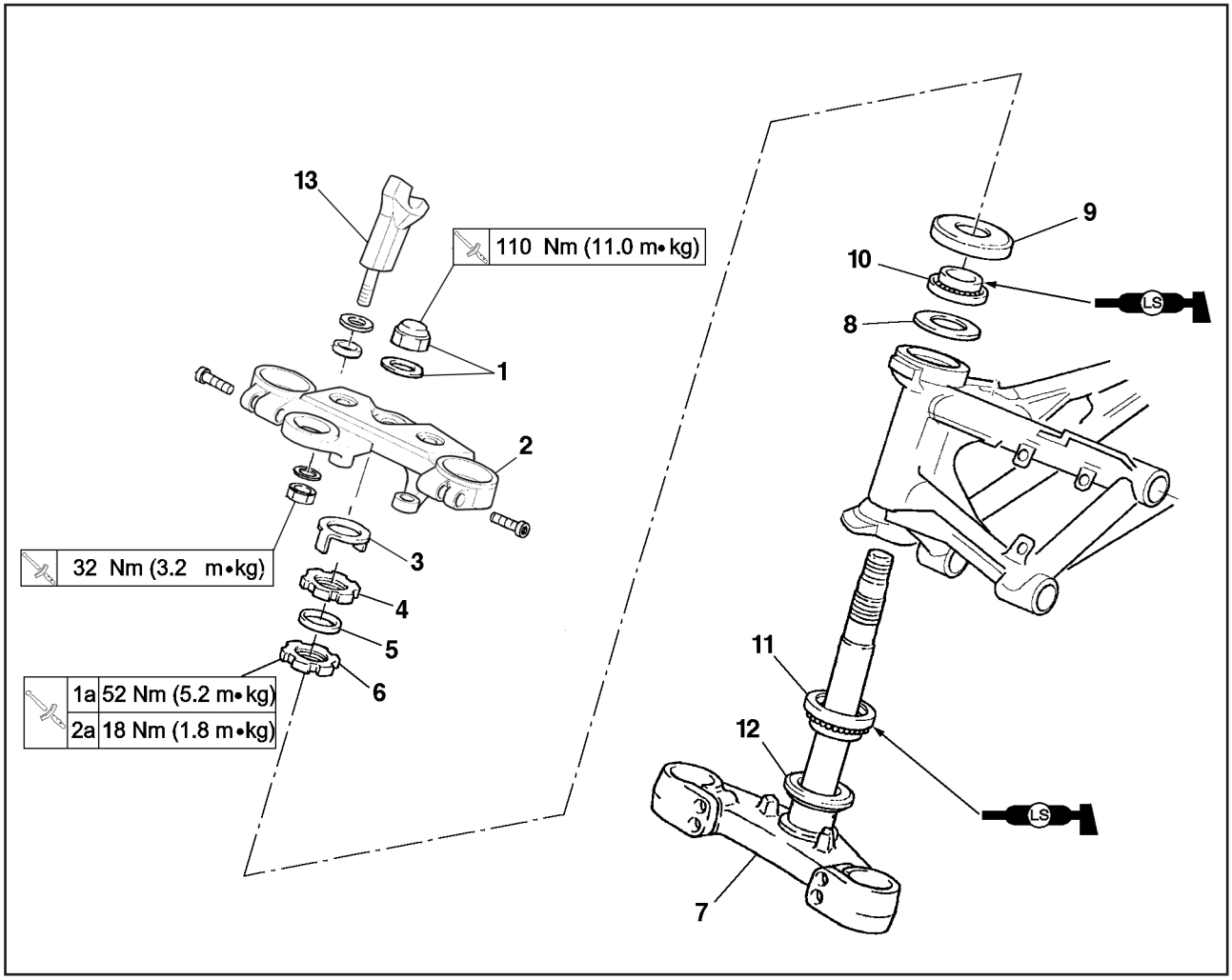
Throttle cable free play (at the flange of the throttle grip)
3 ~ 5 mm

STEERING HEAD

LOWER BRACKET



Order	Job name/Part name	Q'ty	Remarks
	Removing the lower bracket		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Front fork legs		Refer to "FRONT FORK".
	Handlebar		Refer to "HANDLEBAR".
1	Crown nut/washer plate	1/1	Refer to "INSTALLING THE STEERING HEAD".
2	Upper bracket	1	
3	Special washer	1	
4	Upper ring nut	1	Refer to "REMOVING THE LOWER BRACKET/INSTALLING THE STEERING HEAD".
5	Rubber seal	1	
6	Lower ring nut	1	
7	Lower bracket	1	
8	Rubber washer	1	
9	Bearing cover	1	
10	Bearing	1	

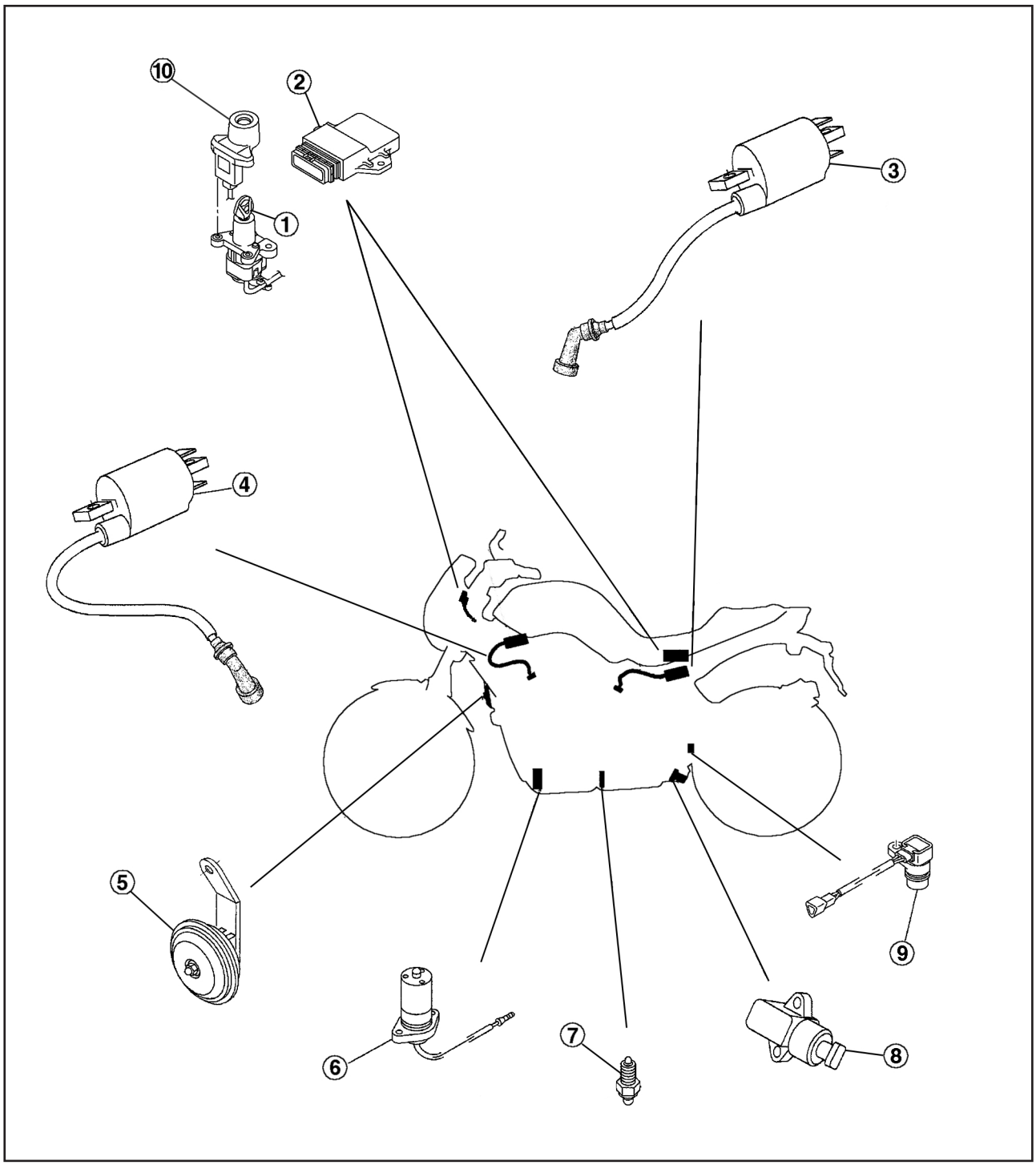


Order	Job name/Part name	Q'ty	Remarks
11	Bearing	1	
12	Dust seal	1	
13	Lower handlebar holder	2	
			For installation, reverse the removal procedure.

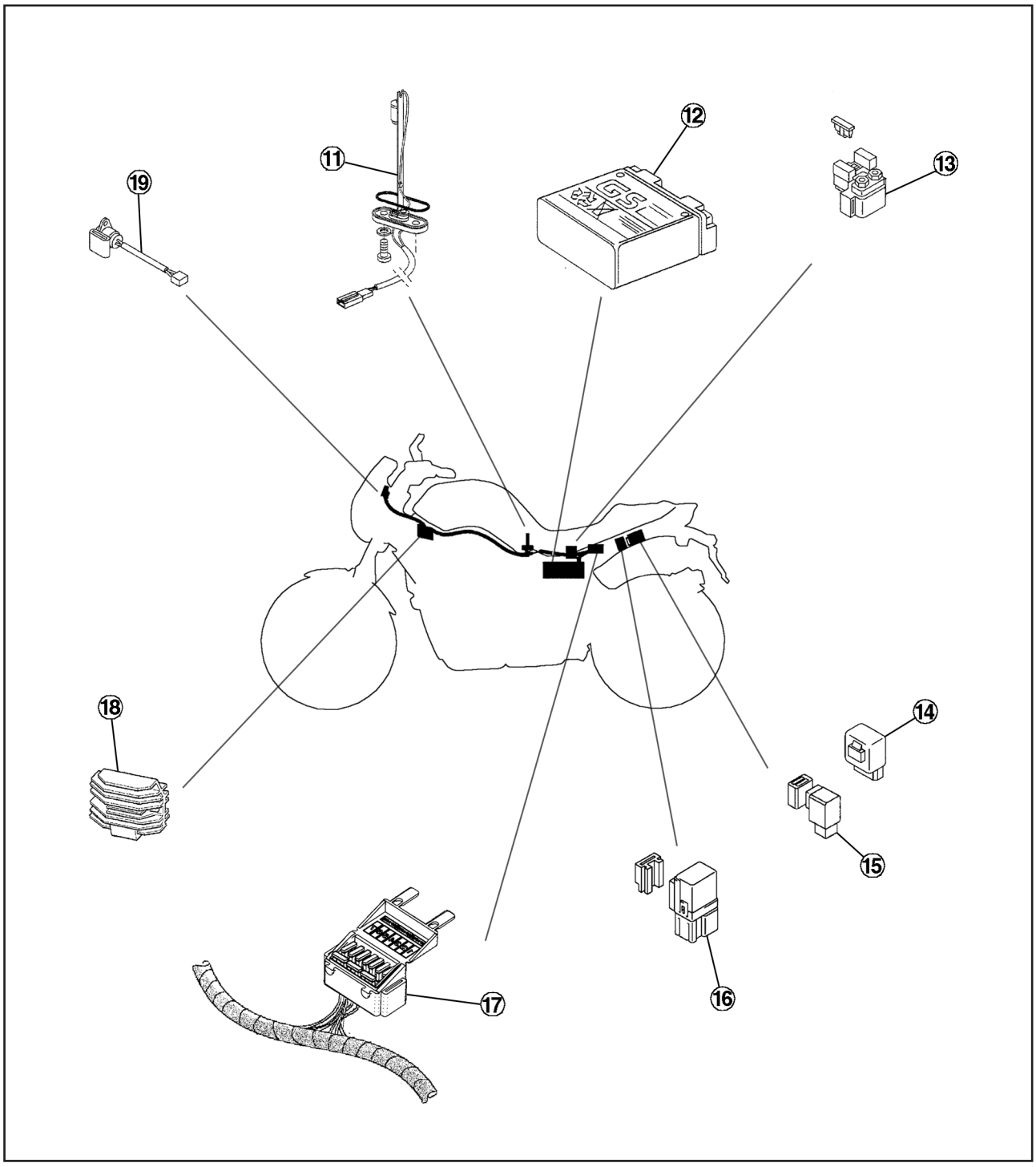
ELECTRICAL

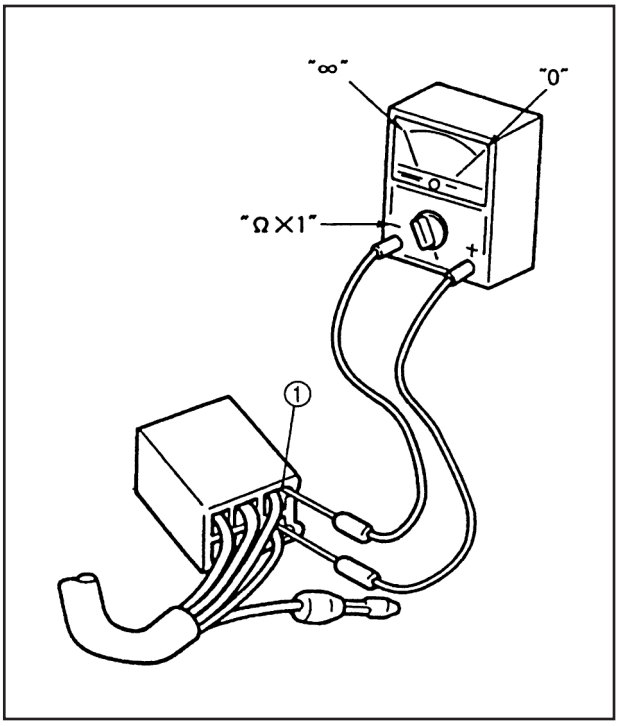
ELECTRICAL COMPONENTS

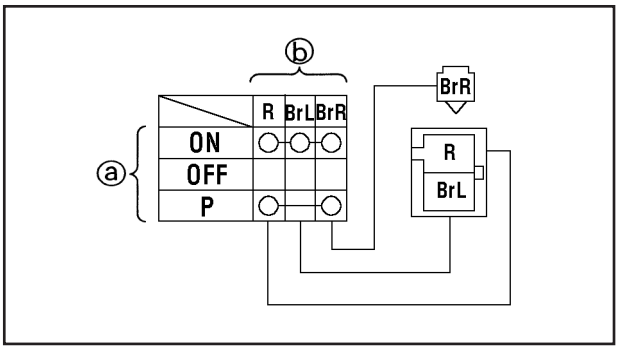
① Main switch
② Igniter unit
③ Ignition coil (rear cylinder)
④ Ignition coil (front cylinder)
⑤ Horn
⑥ Oil level gauge assembly
⑦ Neutral switch
⑧ Sidestand switch
⑨ Speed sensor
⑩ Immobilizer control unit



⑪ Fuel meter senser unit
⑫ Battery
⑬ Starter relay
⑭ Relay assembly
⑮ Flasher relay
⑯ Relay assembly
⑰ Fuse assembly
⑱ Rectifier/regulator
⑲ Thermo switch







EAS0010

SWITCHES

CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

CAUTION:

Never insert the tester probes into the coupler terminal slots ①. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

Pocket tester
90890-03112

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω x 1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.
The switch positions ⓐ are shown in the far left column and the switch lead colors ⓑ are shown in the top row in the switch illustration.

NOTA:

The symbol "○—○" indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

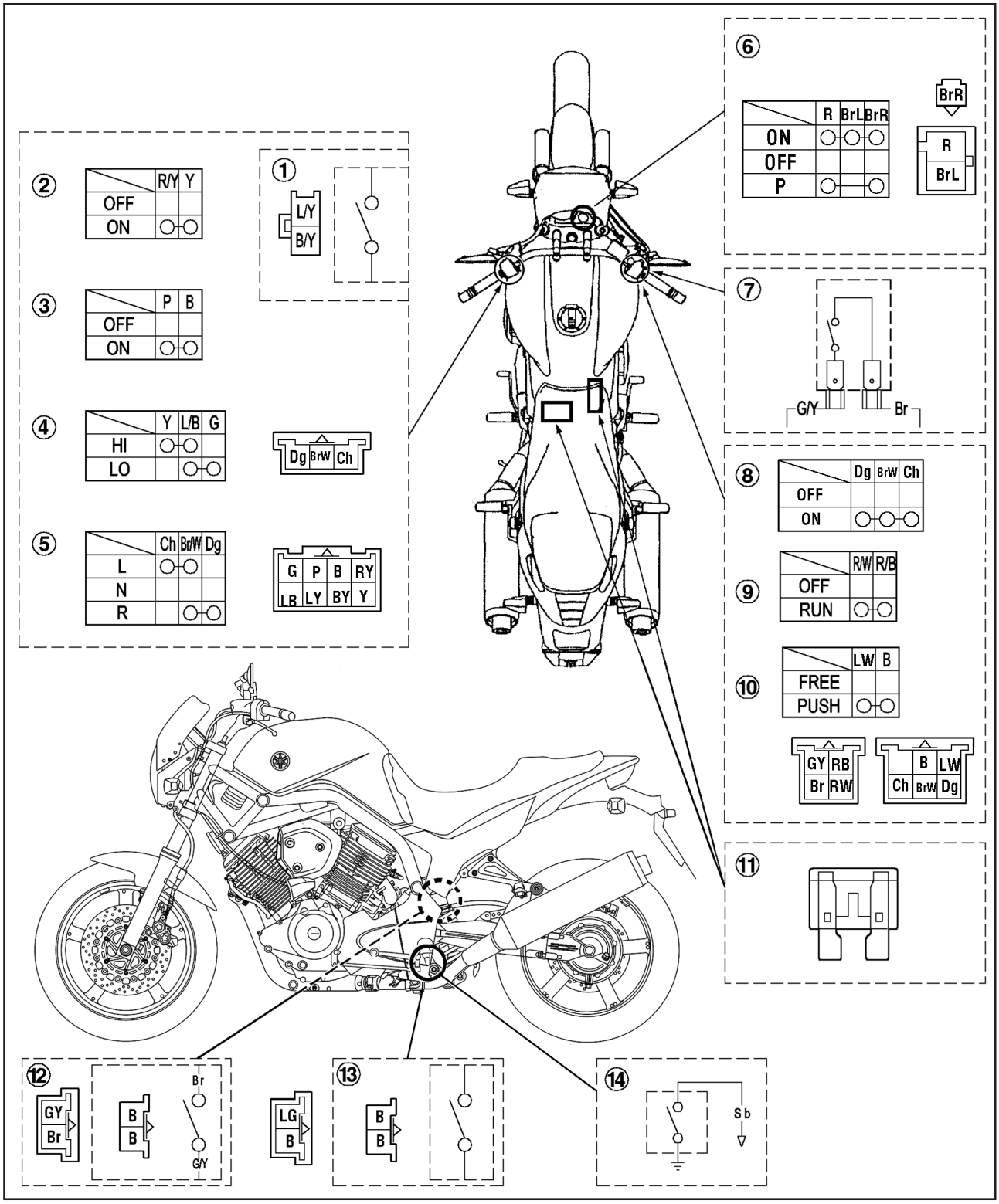
The example illustration on the left shows that:
There is continuity between Brown/Red and Red when the switch is set to "P".
There is continuity between Brown/Red and Red, between Brown/Blue and Red, and between Brown/Blue and Brown/Red when the switch is set to "ON".

EAS00731

CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to “CHECKING SWITCH CONTINUITY”.

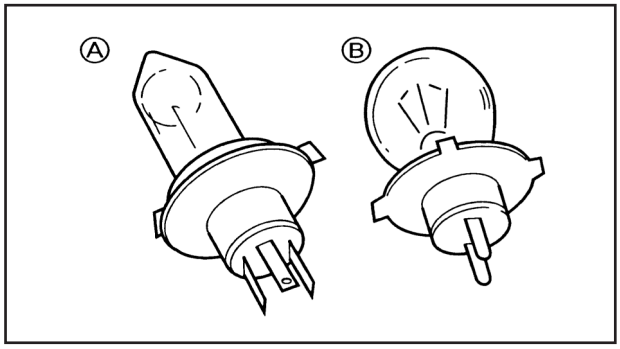
Damage/wear → Repair or replace the switch.
Improperly connected → Properly connect.
Incorrect continuity reading → Replace the switch.

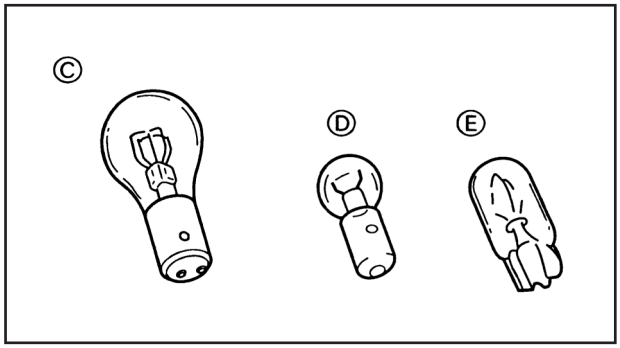


① Clutch switch
② Pass switch
③ Horn switch
④ Dimmer switch
⑤ Turn switch
⑥ Main switch
⑦ Front brake switch
⑧ Hazard switch
⑨ Engine stop switch
⑩ Start switch
⑪ Fuses
⑫ Rear brake switch
⑬ Sidestand switch
⑭ Neutral switch

EAS00732
CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.
Damage/wear → Repair or replace the bulb, bulb socket or both.
Improperly connected → Properly connect.
Incorrect continuity reading → Repair or replace the bulb, bulb socket or both.





TYPES OF BULBS

Le lampadine utilizzate su questo motociclo sono illustrate nella figura a sinistra.
- The bulbs used on this motorcycle are shown in the illustration on the left.
- Bulbs Ⓐ and Ⓑ are used for headlights and usually use a bulb holder which must be detached before removing the bulb. The majority of these bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulb Ⓒ is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs Ⓓ and Ⓔ are used for meter and indicator lights and can be removed from their respective socket by turn Ⓓ and pulling Ⓔ them out.

CHECKING THE CONDITION OF THE BULBS

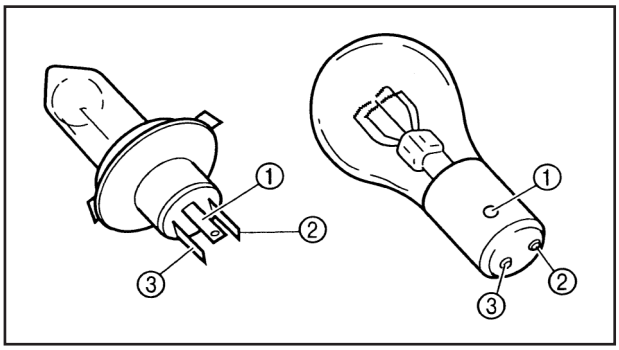
The following procedure applies to all of the bulbs.
1. Remove:
   - bulb

⚠ WARNING

Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

CAUTION:

- **Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.**
- **Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.**



2. Check:
   - bult (for continuity)
     (with the pocket tester)
     No continuity → Replace.

Pocket tester
90890-03112

NOTE:

Before checking for continuity, set the pocket tester to "0" and to the "Ω x 1" range.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the tester positive probe to terminal ① and the tester negative probe to terminal ②, and check the continuity.
b. Connect the tester positive probe to terminal ① and the tester negative probe to terminal ③, and check the continuity.
c. If either of the readings indicate no continuity, replace the bulb.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

CHECKING THE CONDITION OF THE BULB SOCKETS

The following procedure applies to all of the bulb sockets.

1. Check:
   - bulb socket (for continuity)
     (with the pocket tester)
     No continuity → Replace.

Pocket tester
90890-03112

NOTE:

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

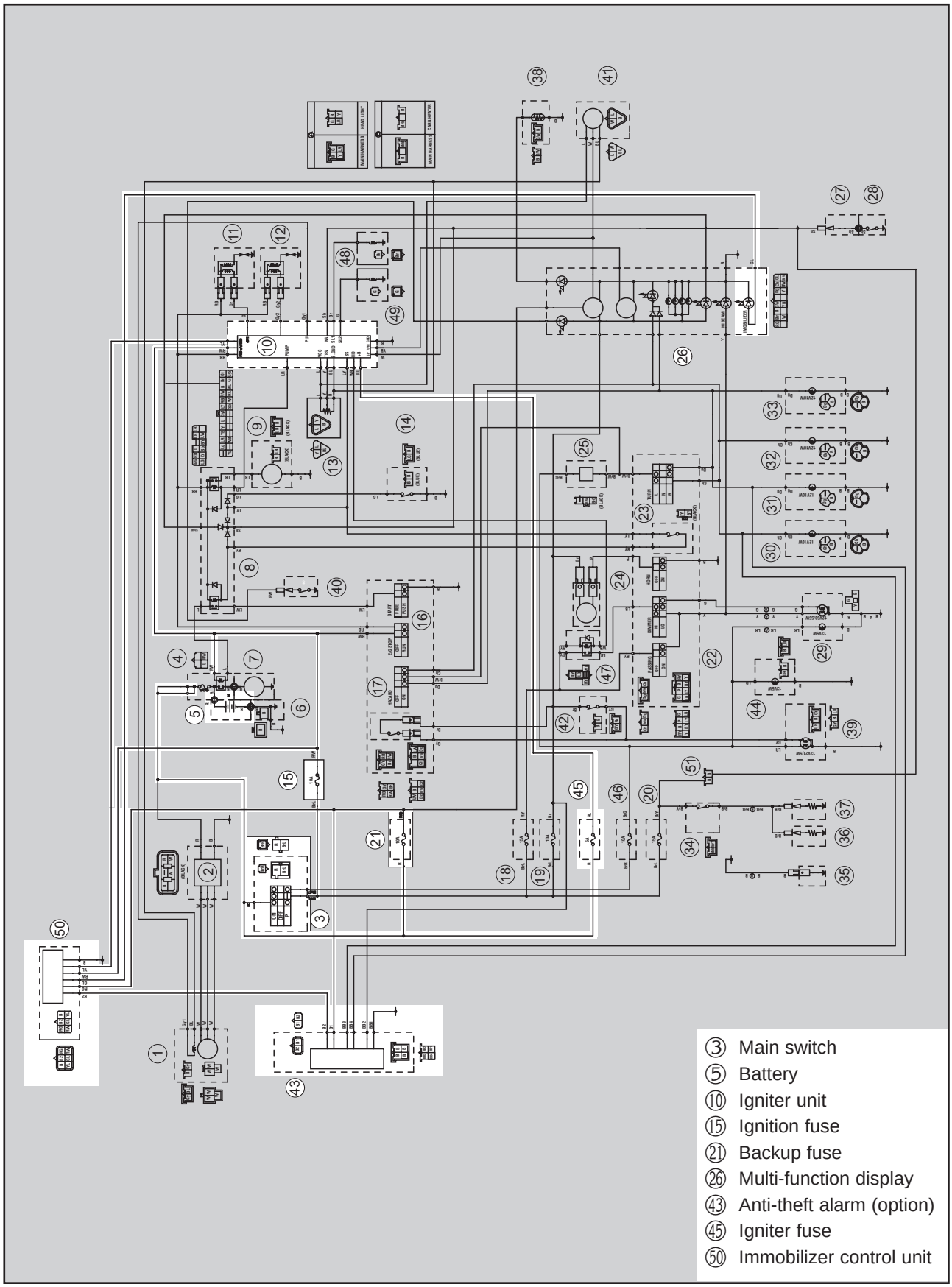
a. Install a good bulb into the bulb socket.
b. Connect the pocket tester probes to the respective leads of the bulb socket.
c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EB805000

IMMOBILIZER SYSTEM

CIRCUIT DIAGRAM



GENERAL INFORMATION

This vehicle is equipped with an immobilizer system to help prevent theft by re-registering codes in the standard keys. This system consists of the following:

- a code re-registering key (with a red bow)
- two standard keys (with a black bow) that can be re-registered with new codes
- a transponder (which is installed in each key bow)
- an immobilizer unit
- the igniter unit
- an immobilizer system indicator light

The key with the red bow is used to register codes in each standard key. Do not use the key with the red bow for driving. It should only be used for re-registering new codes in the standard keys. The immobilizer system cannot be operated with a new key until the key registered with a code. If you lose the code re-registering key, the igniter unit and main switch (included with an immobilizer unit) needs to be re-placed. Therefore, always use a standard key for driving. (See caution below.)

NOTE:

Each standard key is registered during production, therefore re-registering at purchase is not necessary.

CAUTION:

- **DO NOT LOSE THE CODE RE-REGISTERING KEY! If the code re-registering key is lost, registering new codes in the standard keys is impossible. The standard keys can still be used to start the vehicle, however if code re-registering is required (i.e., if a new standard key is made or all keys are lost) the entire immobilizer system must be replaced. Therefore, it is highly recommended to use either standard key after any code re-registering and keep the code re-registering key in a safe place.**
- **Do not submerse either of the keys in water.**
- **Do not expose the keys to excessively high temperatures.**
- **Do not place either of the keys close to magnets (this includes, but not limited to, products such as speakers, etc.).**
- **Do not place heavy items on either key.**
- **Do not grind either key or alter their shape.**
- **Do not disassemble the plastic part of either key.**
- **Keep other immobilizer keys away for this unit's code re-registering key and main switch.**

KEY CODES REGISTRATION METHOD

In the course of use, you may encounter the following case where replace these parts and registration of code re-registering/ standard key is required.

NOTE:

Each standard key is registered during production, therefore re-registering at purchase is not neces-sary.

Replacement parts on troubles

	Replacement parts					Required key registration
	Main switch *1	Immobilizer unit	Standard key	Igniter unit	Accessory lock*2 and key	
Standard key is missing and replace it is required			○			Standard key
All keys have been lost (Including code re-registering key)	○			○	○	Code re-registering key and standard keys
Igniter unit is defective				○		Code re-registering key
Immobilizer unit is defective		○				Code re-registering key and standard keys
Main switch is defective	○			○	○	Code re-registering key and standard keys
Accessory lock*2 is defective					○	No required

*1 Replaced as a set with the immobilizer unit. (Because attended to replace the code re-registering key)
*2 Accessory locks mean the seat lock, fuel tank cap or the helmet holder.

Code re-registering key registration:

When the immobilizer unit or igniter unit is replaced, the unit cannot be used until the key code is registered because it is not registered to the unit.

After replacement of the immobilizer unit or igniter unit:

1. Turn “ON” the main switch with the code re-registering key.
   Make sure the immobilizer system indicator light goes on for about one second and then off.
   This shows that the code re-registering key registration is finished.
2. Check that the engine can be started.
3. Consequently, carry out the standard key registration, according the section below.

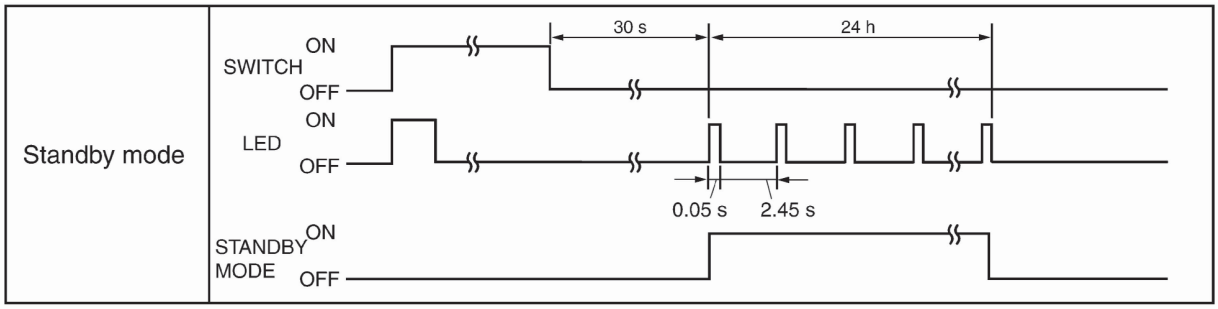
Standard key registration:

When you lose a standard key and need a new one. Or when the code re-registering key is re-registered after the immobilizer unit or igniter unit, are replaced.

NOTE:

It is prohibited to start the engine with the standard key that is not registered.
If the main switch is turned “ON” with the standard key that is not registered, the immobilizer system indicator light blinks and indicates the error code “52”.
(Refer to “SELF-DIAGNOSIS ERROR CODE INDICATION”).

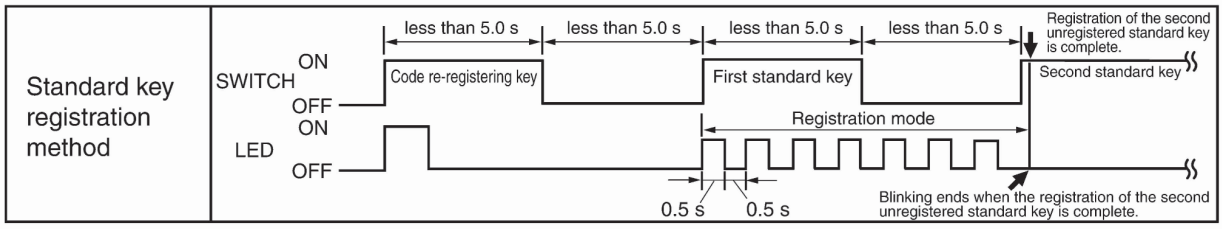
1. Check that the immobilizer system indicator light is flashing. It indicates the “standby mode”. To initiate the standby mode, turn “OFF” the main switch and then it will be the standby mode when it passes 30 seconds. After 24 hours have passed, the indicator light stop flashing and the standby mode ends.



2. After the main switch is turned “ON” with the code re-registering key, before 5 seconds elapses, turn “OFF” the main switch and then turn “ON” the main switch with the standard key (the first new key) that you want to register.
3. It enters the key registration mode and the two standard key codes that have been stored in the memory are erased and the first new standard key code will be registered. At this time, the indicator light rapidly blinks (“OFF” for 0.5 sec. and “ON” for 0.5 sec.).
4. In the condition as mentioned above (while the indicator light continues rapid flashing), after the main switch is turned “ON” with the first new standard key, turn “OFF” the main switch before 5 seconds elapses, and then turn “ON” the main switch with the standard key that you want to register (which is the second new key or the standard key remained in hand).
5. When the registration is finished, the indicator light goes off.
6. Check that the engine can be started with the two registered standard keys.

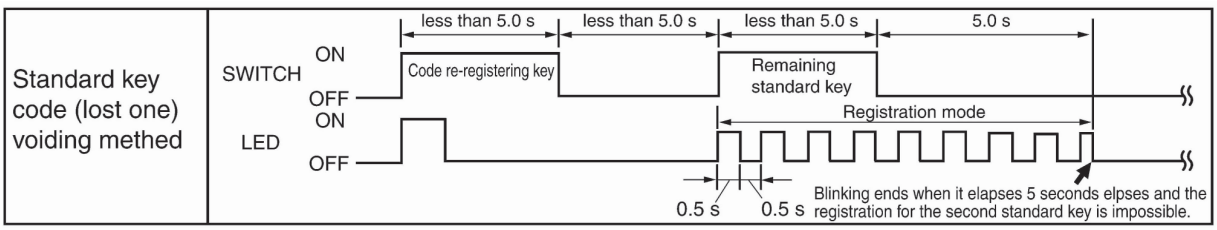
NOTE:

The flashing stops when 5 seconds elapses and the registration mode is finished. In this case, the seccond standard key cannot be registered and only the first standard key is registered.



Voiding the standard key code:

If you lose one standard key that you used and you want to make the lost standard key unable to be used anymore, re-register another standard key. To re-register, refer to “Standard key registration”.
This re-registration disables the lost standard key because its key code has been changed.



EAS00781

TROUBLESHOOTING

The immobilizer system fail to operate. (The immobilizer system indicator light starts to blinking the self-diagnosis code sequence.)

Check:
1. Main, ignition and backup fuses
2. Battery
3. Main switch
4. Wiring (of the entire immobilizer system)

NOTE:
- Before troubleshooting, remove the following part(-s).

1) Seat
2) Side covers
3) Fuel tank (lift)
4) Cowling (lift forward)
5) Storage compartment/battery cover

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00738

1. Main, ignition and backup fuses

- Check the main, ignition and backup fuses for continuity.
  Refer to “CHECKING THE FUSES” in chapter 3.
- Are the main, ignition and backup fuses OK?

YES

NO → Replace the fuse(-s).

EAS00739

2. Battery

- Check the condition of the battery. Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C

- Is the battery OK?

YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3. Main switch

- Check the main switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES

NO → Replace the main switch.

EAS00787

4. Wiring

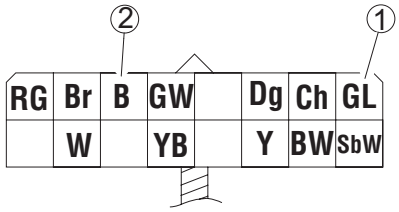
- Check the entire immobilizer system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the immobilizer system’s wiring properly-connected and without defects?

YES → Check the condition of each of the immobilizer system’s circuits.
Refer to “CHECKING THE IMMOBILIZER SYSTEM”.

NO → Properly connect or repair the immobilizer system’s wiring.

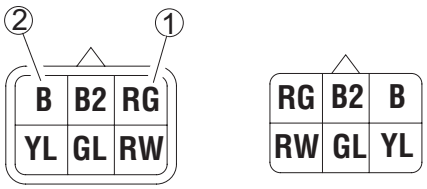
CHECKING THE IMMOBILIZER SYSTEM

1. Immobilizer system indicator light does not go on when the main switch is turned “ON”.

1. Voltage
• Connect the pocket tester (DC 20 V) to the multi-function display couplers as shown.
Tester positive probe – green/blue ① **Tester negative probe – black** ②

• Set the main switch to “ON”. • Measure the voltage (12 V) between green/blue and black on the multi-function display. • Are the voltage within specification?

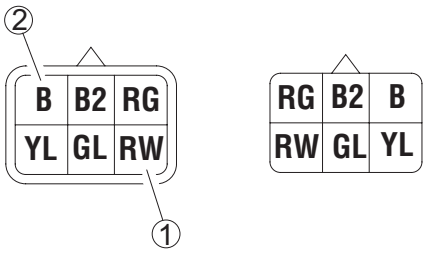
YES → Replace the multi-function display

NO →

2. Voltage
• Connect the pocket tester (DC 20 V) to the immobilizer unit couplers as shown.
Tester positive probe – red/ green ① **Tester negative probe – black** ②

• Set the main switch to “ON”. • Measure the voltage (12 V) between red/green and black on the immobilizer unit. • Are the voltage within specification?

YES →

NO → The wiring circuit from the battery to the immobilizer unit is faulty and must be repaired.

3. Voltage
• Connect the pocket tester (DC 20 V) to the immobilizer unit couplers as shown.
Tester positive probe – red/white ① **Tester negative probe – black** ②

• Set the main switch to “ON”. • Measure the voltage (12 V) between red/white and black on the immobilizer unit. • Are the voltage within specification?

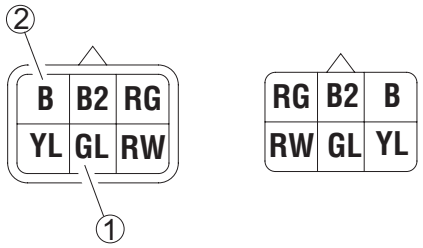
YES →

NO → The wiring circuit from the main switch to the immobilizer unit is faulty and must be repaired.

4. Voltage

• Connect the pocket tester (DC 20 V) to the immobilizer unit couplers as shown.

Tester positive probe – green/blue ①
Tester negative probe – black ②



• Set the main switch to “ON”.
• Measure the voltage (12 V) between green/blue and black on the immobilizer unit.
• Are the voltage within specification?

YES

Replace the immobilizer unit.

NO

The wiring circuit from the immobilizer unit to the multi-function display is faulty and must be repaired.

SELF-DIAGNOSIS ERROR CODE INDICATION

When the system failure occurred, the error code number is indicated in the immobilizer system indicator light blinks at the same time. The pattern of blinking also shows the error code.

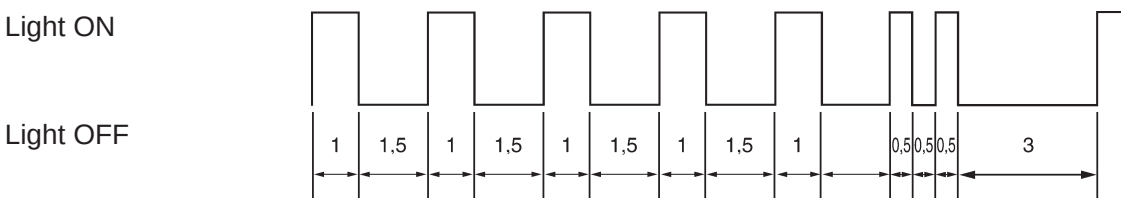
Error code	Detection	Symptoms	Trouble	Measures
51	IMMOBILIZER UNIT	Cannot transmit code between the key and immobilizer unit.	1) Objects that may keep off radio waves exist around the keys and antennas. 2) Immobilizer unit failure. 3) Key failure.	1) Keep clear of magnets, metals and other keys from the surroundings of keys and antennas. 2) Replace the immobilizer unit. 3) Replace the key.
52	IMMOBILIZER UNIT	Codes do not match between the key and immobilizer unit.	1) Disturbed by other transponder. Failed to verify continually for ten times. 2) Unregistered sub key was used.	1) Place the immobilizer unit away more than 50 mm from the transponder of other vehicle. 2) Register the standard key.
53	IMMOBILIZER UNIT	Cannot transmit code between the ignitor unit and immobilizer unit.	Noise interference or disconnected lead/cable. 1) Obstruction due to radio wave noise. 2) Error by disconnection of the communication harness. 3) Immobilizer unit failure. 4) Ignitor unit failure.	1) Check the wire harness and connector. 2) Replace the immobilizer unit. 3) Replace the ignitor unit.
54	IMMOBILIZER UNIT	Codes do not match between ignitor unit and immobilizer unit.	Noise interference or disconnected lead/cable. 1) Obstruction due to radio wave noise. 2) Immobilizer unit failure. 3) Ignitor unit failure (When the used parts from other vehicles are used, the code re-registering key ID is not registered to the ECU.)	1) Register the code re-registering key ID. 2) Replace the immobilizer unit. 3) Replace the ignitor unit.
55	IMMOBILIZER UNIT	Key code registration error.	Same standard key was attempted to continuously two times register.	Prepare the new standard key and register it.
56	ECU IGNITER UNIT	Underfinition code is received.	Noise interference or disconnected lead/cable.	1) Check the wire harness and connector. 2) Replace the immobilizer unit. 3) Replace the ignitor unit.

Immobilizer system indicator light error code indication

Digit of 10: Cycles of 1 sec. ON and 1.5 sec. OFF.

Digit of 1: Cycles of 0.5 sec. ON and 0.5 sec. OFF.

<Example> 52



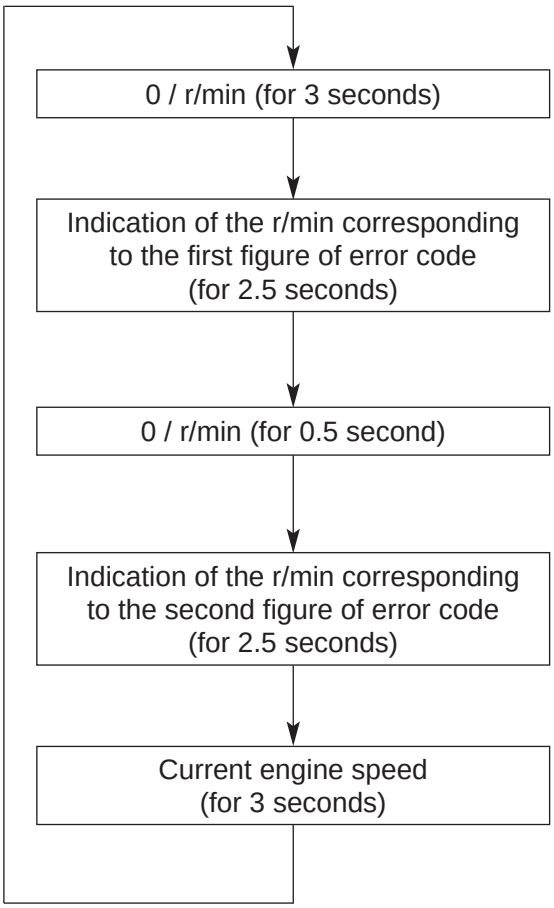
SELF-DIAGNOSIS DEVICE

When the key is turned to "ON", the tachometer and speedometer needles should move to the maximum, then back to zero. In addition all the warning lights and the indicator lights should come on for a few seconds, then go off. If the tachometer or speedometer needle does not move as described or either of the warning lights or indicator lights do not come on, check their electrical circuits.

This model is equipped with a self-diagnosis device for the following electrical circuits:
- speedometer
- tachometer
- throttle position sensor
- speed sensor
- ignition coil No. 1
- ignition coil No. 2
- fuel cut solenoid carburetor No. 1
- fuel cut solenoid carburetor No. 2.

If any of the above circuits are defective, the tachometer needle will repeatedly signal a two digit error code (e.g., 15, 16, 23, 24, 33, 34, 42).

If the tachometer needle signal such an error code, note the circuit-specific number of r/min and check the operation of the system according to the following procedure.


0 / r/min (for 3 seconds)
Indication of the r/min corresponding to the first figure of error code (for 2.5 seconds)
0 / r/min (for 0.5 second)
Indication of the r/min corresponding to the second figure of error code (for 2.5 seconds)
Current engine speed (for 3 seconds)

Specific r/min	Faulty electrical circuit	Condition	Fail-safe action
1 5 r/min	Throttle position sensor	Disconnected Short-circuit	Fixes the throttle position sensor to fully open.
1 6 r/min	Throttle position sensor	Locked	Fixes the throttle position sensor to fully open.
2 3 r/min	Fuel cut solenoid carburetor No. 1	Disconnected Short-circuit	
2 4 r/min	Fuel cut solenoid carburetor No. 2.	Disconnected Short-circuit	
3 3 r/min	Ignition coil No. 1	Open circuit the primary	Fuel is cut off only to the cylinder in which a malfunction is detected.
3 4 r/min	Ignition coil No. 2	Open circuit the primary	Fuel is cut off only to the cylinder in which a malfunction is detected.
4 2 r/min	Speed sensor	Disconnected Short-circuit	

EASB0044

TROUBLESHOOTING

The tachometer displays the throttle position sensor/speed sensor error code.

Check:
1. Throttle position sensor
2. Speed sensor
3. Ignition coil N. 1 and 2
4. Fuel-cut solenoid N. 1 and 2

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Seat
2) Side cover (left)
3) Fuel tank (lift)
4) Air filter case

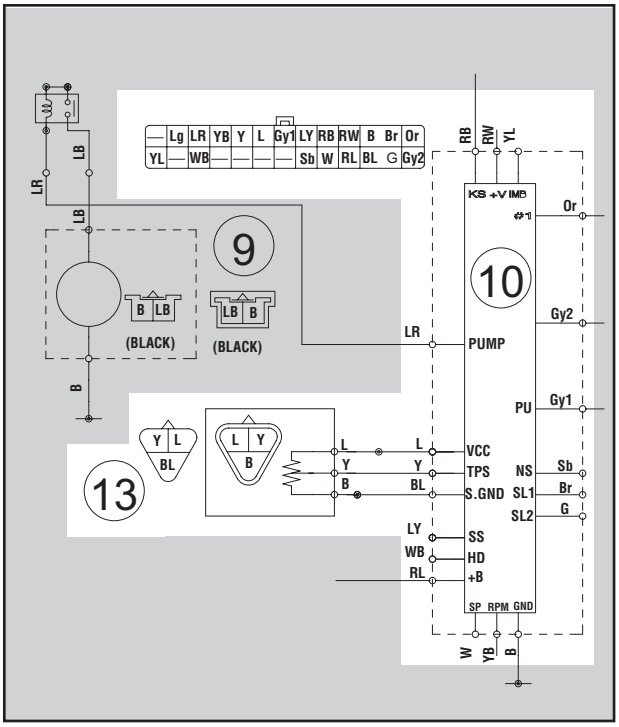
- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00836

1. Throttle position sensor

CIRCUIT DIAGRAM



⑩ Ignitor unit
⑬ Throttle position sensor

1. Wire harness
• Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM". • Is the wire harness OK?

YES ⇩ NO ⇩

Repair or replace the wire harness.

EB812401

2. Throttle position sensor
• Check the throttle position sensor for continuity. Refer to "CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR" in Chapter 5. • Is the throttle position sensor OK?

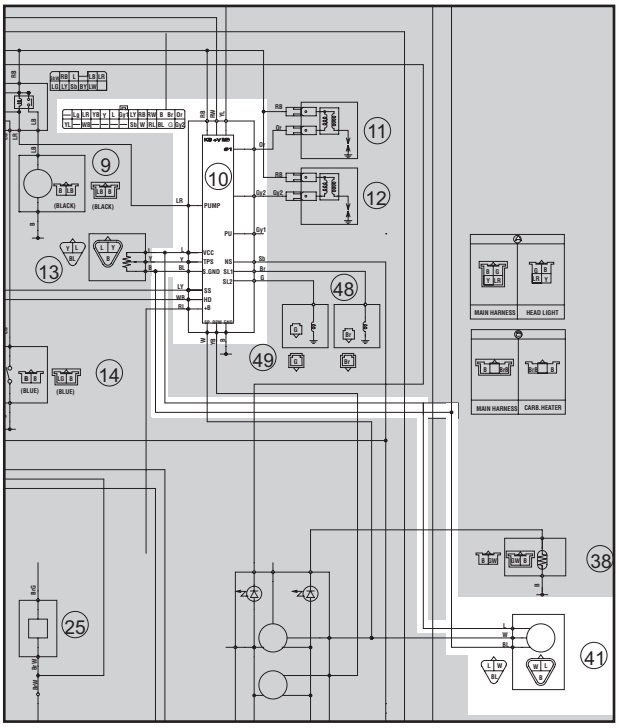
YES ⇩ NO ⇩

Replace the ignitor unit.

Replace the throttle position sensor.

1. Speed sensor

CIRCUIT DIAGRAM



⑩ Ignitor unit
㊶ Speed sensor

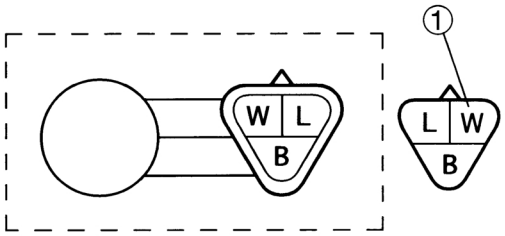
1. Wire harness
• Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM". • Is the wire harness OK?

YES

NO

Repair or replace the wire harness.

2. Speed sensor
• Place the motorcycle on a suitable stand so that the rear wheel is elevated. • Connect the pocket tester (DC 20 V) to the speed sensor connector.
Tester (+) lead → White terminal ① **Tester (–) lead → Body earth**



• Set the main switch to "ON".
• Turn the rear wheel slowly.
• Check the tester voltage (0 V ~ 5 V ~ 0 V).
• Is the speed sensor OK?

YES

Replace the ignitor unit.

NO

Replace the speed sensor.

3. Ignition coil N. 1 and 2

1. Wiring

- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

YES

NO

Repair or replace the wire harness.

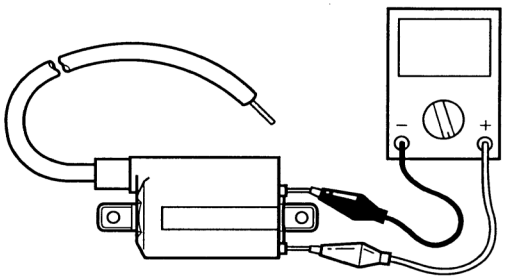
EAS00747

2. Ignition coil resistance

The following procedure applies to all of the ignition coils.

- Disconnect the ignition coil connectors from the ignition coil terminals.
- Connect the pocket tester (Ω × 1) to the ignition coil as shwon.

Tester positive probe → Red/Black
Tester negative probe → Orange (Gray)

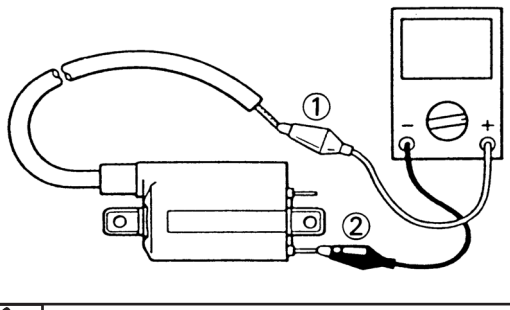


- Measure the primary coil resistance.

Primary coil resistance
3.57 ~ 4.83 Ω at 20°C (68 °F)

- Connect the pocket tester (Ω × 1k) to the ignition coil as shown.
- Measure the secondary coil resistance.

Tester positive probe →
spark plug lead ①
Tester negative probe →
Orange (gray) lead ②



Secondary coil resistance
10.7 ~ 14.5 kΩ at 20°C (68°F)

- Is the ignition coil OK?

YES

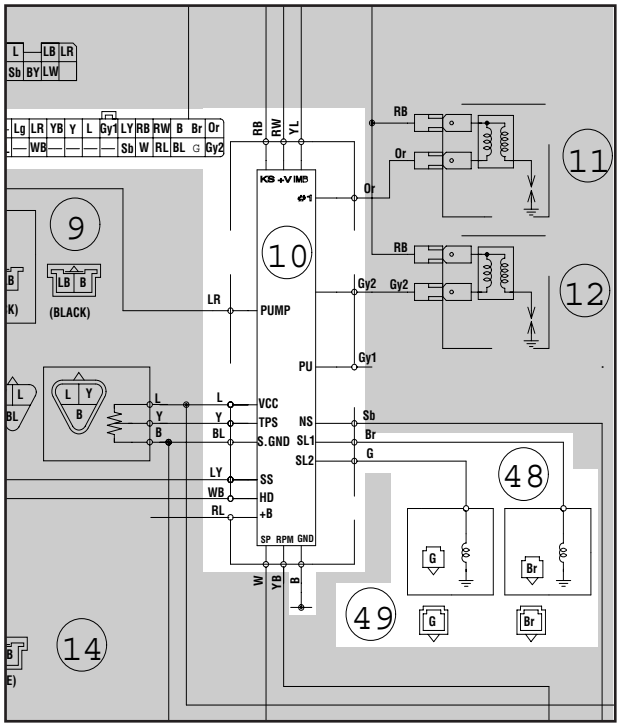
NO

Replace the ignitor unit.

Replace the ignition coil.

4. Fuel-cut solenoid (EUR)

CIRCUIT DIAGRAM



⑩ Igniter unit
㊽ Fuel-cut solenoid 1
㊾ Fuel-cut solenoid 2

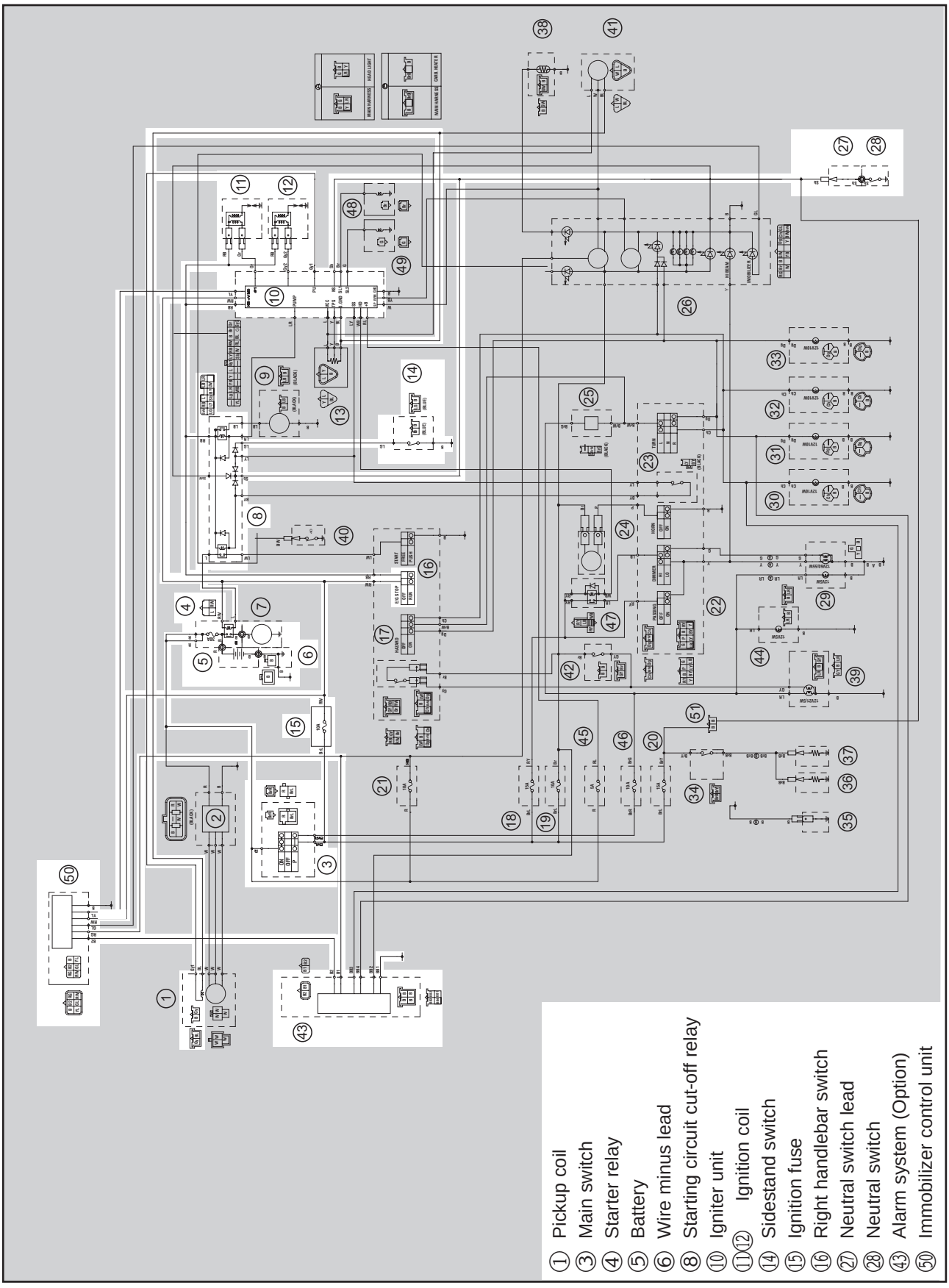
1. Wire harness
• Check the wire harness for continuity. Refer to “CIRCUIT DIAGRAM”. • Is the wire harness OK?

YES → Replace the fuel-cut solenoid 1 or 2.

NO → Repair or replace the wire harness.

IGNITION SYSTEM

CIRCUIT DIAGRAM



EASB0030

TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

Check:
1. Main and ignition fuses
2. Battery
3. Spark plugs
4. Ignition spark gap
5. Spark plug cap resistance
6. Ignition coil resistance
7. Pickup coil resistance
8. Main switch
9. Engine stop switch
10. Neutral switch
11. Sidestand switch
12. Wiring (of the entire ignition system)

NOTE:

• Before troubleshooting, remove the following part(-s):
1) Seat
2) Side covers
3) Fuel tank (lift)
4) Cowling (lift forward)
5) Storage compartment/battery cover
6) Cylinder head covers

• Troubleshoot with the following special tool(-s).

Ignition checker
90890-06754
Pocket tester
90890-03112

EAS00738

1. Main and ignition fuses

• Check the main and ignition fuses for continuity.
Refer to "CHECKING THE FUSES" in Chapter 3.
• Are the main and ignition fuses OK?

YES

NO → Replace the fuse(-s).

EAS00739

2. Battery

• Check the condition of the battery.
Refer to "CHECKING AND CHARGING THE BATTERY" in Chapter 3.

Min. open-circuit voltage
12.8 V or more at 20 °C (68 °F)

• Is the battery OK?

YES

NO →
• Clean the battery terminals.
• Recharge or replace the battery.

EAS00741

3. Spark plugs

The following procedure applies to all of the spark plugs.
• Check the condition of the spark plug.
• Check the spark plug type.
• Measure the spark plug gap.
Refer to "CHECKING THE SPARK PLUGS" in Chapter 3.

Standard spark plug
BPR7ES
W22EPR-U
Spark plug gap
0.7 ~ 0.8 mm

• Is the spark plug in good condition, is it of the correct type, and its gap within specification?

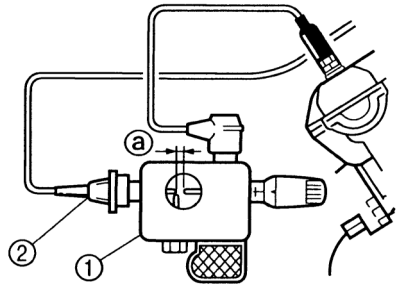
YES

NO → Re-gap or replace the spark plug.

EAS00743

4. Ignition spark gap

The following procedure applies to all of the spark plugs.
- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.
- Spark plug cap ②.
- Set the main switch to “ON”.
- Measure the ignition spark gap ⓐ.
- Crank the engine by pushing the start switch and gradually increase the spark gap until a misfire occurs.



Min. ignition spark gap
6 mm

- Is there a spark and is the spark gap within specification ?

NO

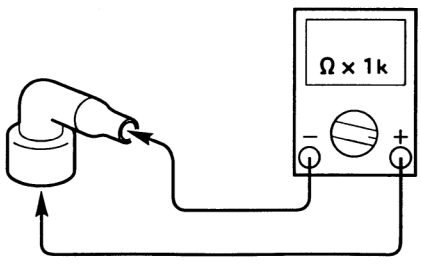
The ignition system is OK.

YES

EAS00745

5. Spark plug cap resistance.

The following procedure applies to all of the spark plug caps.
- Disconnect the spark plug cap from the spark plug.
- Connect the pocket tester (Ω × 1k) to the spark plug cap as shown.
- Measure the spark plug cap resistance.



Spark plug cap resistance
10 kΩ at 20°C (68 °F)

- Is the spark plug cap OK?

YES

NO

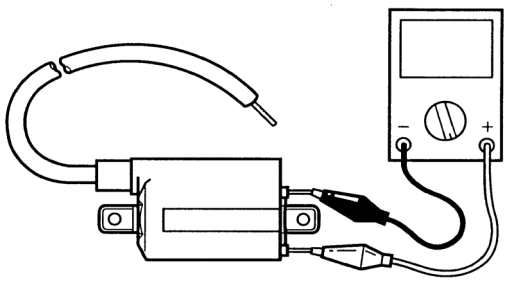
Replace the spark plug cap.

EAS00747

6. Ignition coil resistance

The following procedure applies to all of the ignition coils.
- Disconnect the ignition coil connectors from the ignition coil terminals.
- Connect the pocket tester (Ω × 1) to the ignition coil as shwon.

Tester positive probe → Red/Black
Tester negative probe → Orange (Gray)

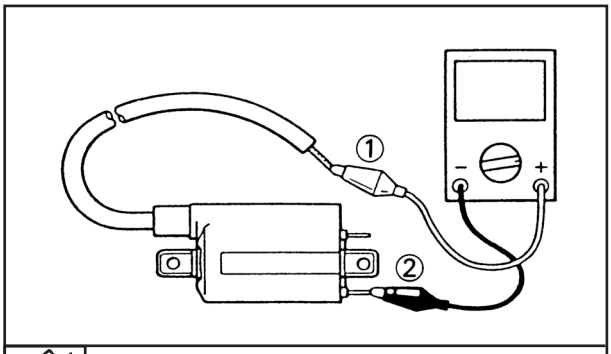


- Measure the primary coil resistance.

Primary coil resistance
3.57 ~ 4.83 Ω at 20°C (68 °F)

- Connect the pocket tester (Ω × 1k) to the ignition coil as shown.
- Measure the secondary coil resistance.

Tester positive probe →
spark plug lead ①
Tester negative probe →
Orange (gray) lead ②



Secondary coil resistance
10.7 ~ 14.5 kΩ at 20°C (68°F)

• Is the ignition coil OK?

YES

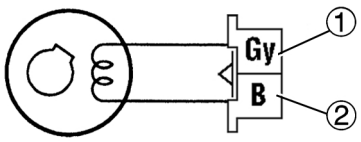
NO → Replace the ignition coil.

EAS00748

7. Pickup coil resistance

• Disconnect the pickup coil coupler from the wire harness.
• Connect the pocket tester (Ω × 100) to the pickup coil terminal.

Tester positive probe → Gray ①
Tester negative probe → Black ②



• Measure the pickup coil resistance.

Pickup coil resistance
189 ~ 231 Ω at 20°C (68°F)
(between Gray and Black)

• Is the pickup coil OK?

YES

NO → Replace the pickup coil.

EAS00749

8. Main switch

• Check the main switch for continuity.
Refer to “CHECKING THE SWITCHES”.
• Is the main switch OK?

YES

NO → Replace the main switch.

EAS00750

9. Engine stop switch

• Check the engine stop switch for continuity.
Refer to “CHECKING THE SWITCHES”.
• Is the engine stop switch OK?

YES

NO → Replace the right handlebar switch.

EAS00751

10. Neutral switch

• Check the neutral switch for continuity.
Refer to “CHECKING THE SWITCHES”.
• Is the neutral switch OK?

YES

NO → Replace the neutral switch.

EAS00752

11. Sidestand switch

• Check the sidestand switch for continuity.
Refer to “CHECKING THE SWITCHES”.
• Is the sidestand switch OK?

YES

NO → Replace the sidestand switch.

✳

EAS00754

14. Wiring

- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

NO

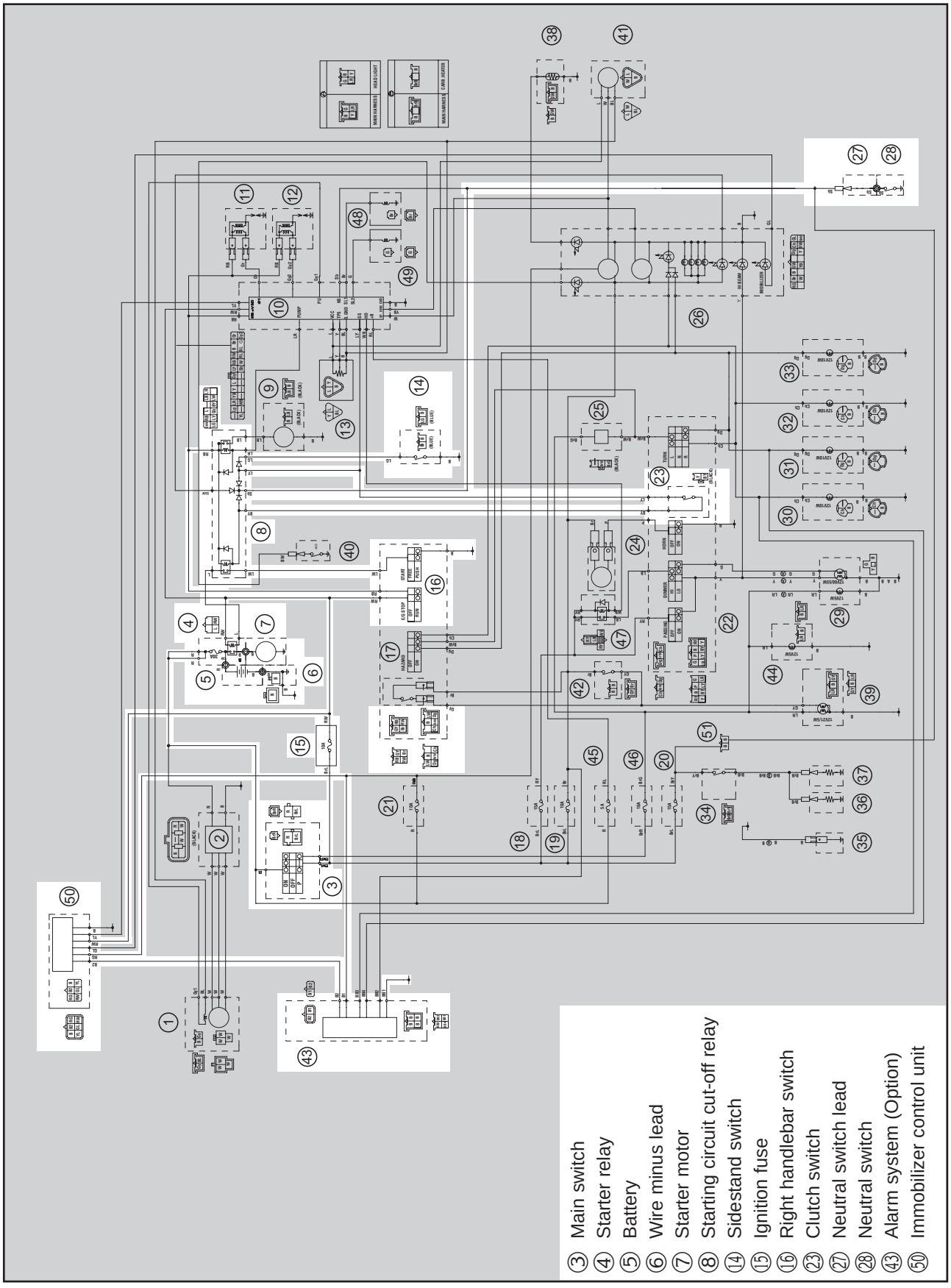
Properly connect or repair the ignition system's wiring.

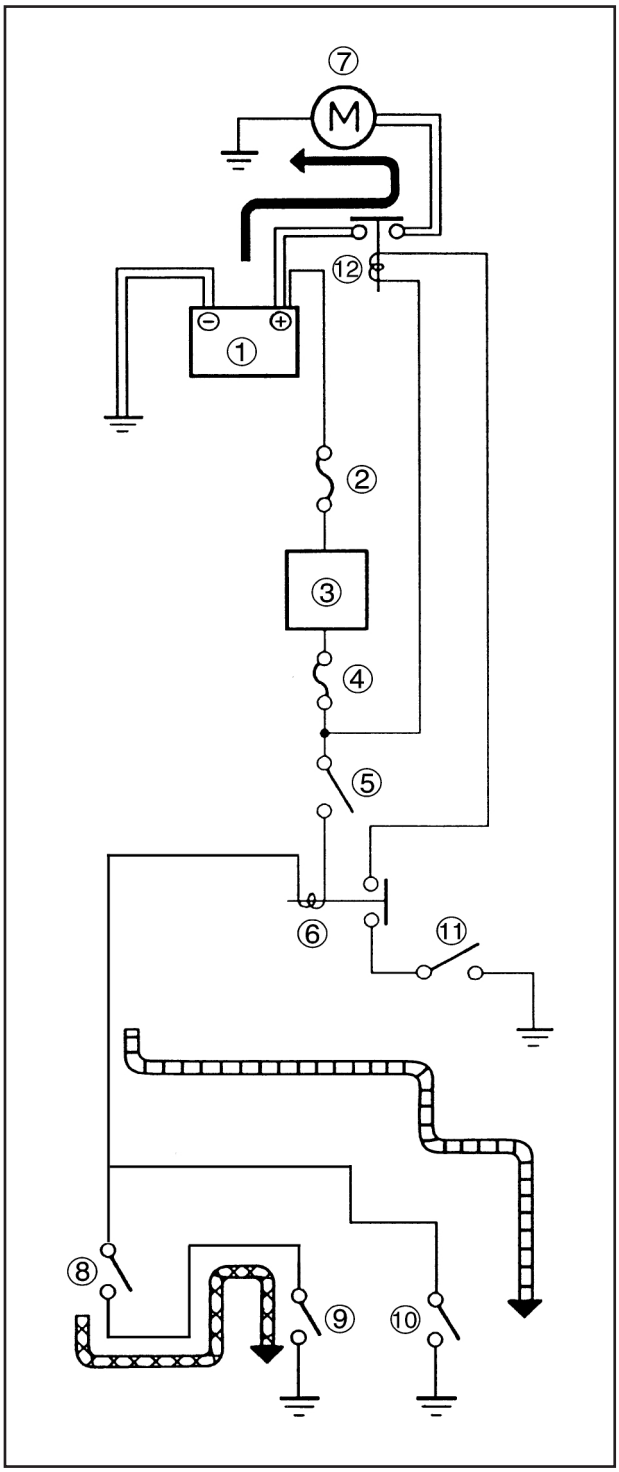
YES

Replace the ignitor unit.

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM





EB803010

STARTING CIRCUIT OPERATION

The starting circuit on this model consists of the starter motor, starter relay, and the starting circuit cut-off relay. If the engine stop switch is on "RUN" and the main switch is on "ON" (both switches are closed), the starter motor can operate only if:

The transmission is in neutral (the neutral switch is closed).

or if

The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cut-off relay prevents the starter from operating when neither of these conditions have been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor.

When at least one of the above conditions have been met however, the starting circuit cut-off relay is closed, and the engine can be started by pressing the starter switch.

WHEN THE TRANSMISSION IS IN NEUTRAL

WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED IN

① Battery
② Main fuse
③ Main switch
④ Ignition fuse
⑤ Engine stop switch
⑥ Starting circuit cut-off relay
⑦ Starter motor
⑧ Clutch switch
⑨ Sidestand switch
⑩ Neutral switch
⑪ Start switch
⑫ Starter relay

EASB0031

TROUBLESHOOTING

The starter motor fails to turn.

Check:
1. Main and ignition fuses
2. Battery
3. Starter motor
4. Starting circuit cut-off relay
5. Starter relay
6. Main switch
7. Engine stop switch
8. Neutral switch
9. Sidestand switch
10. Clutch switch
11. Start switch
12. Wiring (of the entire starting system)

NOTE:

- Before troubleshooting, remove the following part(-s):

1) Seat
2) Side covers
3) Fuel tank (lift)
4) Cowling (lift forward)
5) Storage compartment/battery cover

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00738

1. Main and ignition fuses

- Check the main and ignition fuses for continuity.
  Refer to “CHECKING THE FUSES” in Chapter 3
- Are the main and ignition fuses OK?

YES

NO → Replace the fuse(-s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to “CHECKING AND CHARGING THE BATTERY” in Chapter 3.

Min. open-circuit voltage:
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

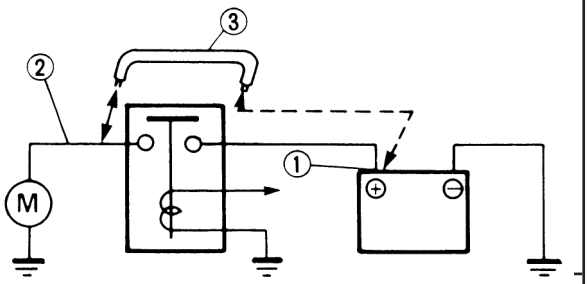
YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00758

3. Starter motor

- Connect the battery positive terminal ① and starter motor lead ② with a jumper lead ③.



⚠ WARNING

- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore make sure that no flammable gas or fluid is in the vicinity.**

- Does the starter motor turn?

YES

NO →
Repair or replace the starter motor.

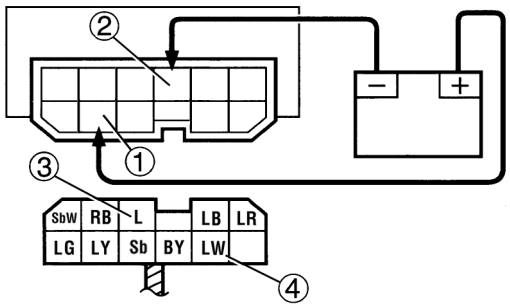
EAS00739

4. Starting circuit cut-off relay

- Disconnect the relay unit from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12V) to the relay unit terminals as shown.

Battery positive terminal → Red/Black ①
Battery negative terminal → Black/Yellow ②

Tester positive probe → Blue ③
Tester negative probe → Blue/White ④



- Does the starting circuit cut-off relay have continuity between Black and Blue/White?

YES

NO → Replace the relay unit.

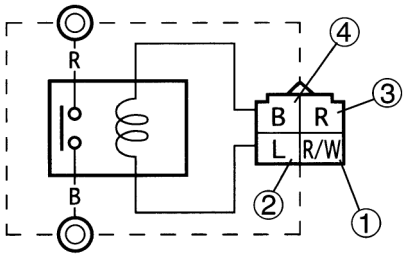
EAS00761

5. Starter relay

- Disconnect the starter relay from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12V) to the starter relay coupler as shown.

Battery positive terminal → Red/White ①
Battery negative terminal → Blue ②

Tester positive probe → Red ③
Tester negative probe → Black ④



- Does the starter relay have continuity between Red and Black?

YES

NO → Replace the starter relay.

EAS00749

6. Main switch

- Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES

NO → Replace the main switch.

EAS00750

7. Engine stop switch

- Check the engine stop switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the engine stop switch OK?

YES ⇩

NO ⇩

Replace the right handlebar switch.

EAS00751

8. Neutral switch

- Check the neutral switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the neutral switch OK?

YES ⇩

NO ⇩

Replace the neutral switch.

EAS00752

9. Sidestand switch

- Check the sidestand switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the sidestand switch OK?

YES ⇩

NO ⇩

Replace the sidestand switch.

EAS00763

10. Clutch switch

- Check the clutch switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the clutch switch OK?

YES ⇩

NO ⇩

Replace the clutch switch.

EAS00764

11. Start switch

- Check the start switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the start switch OK?

YES ⇩

NO ⇩

Replace the right handlebar switch.

EAS00766

12. Wiring

- Check the entire starting system’s wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the starting system’s wiring properly connected and without defects?

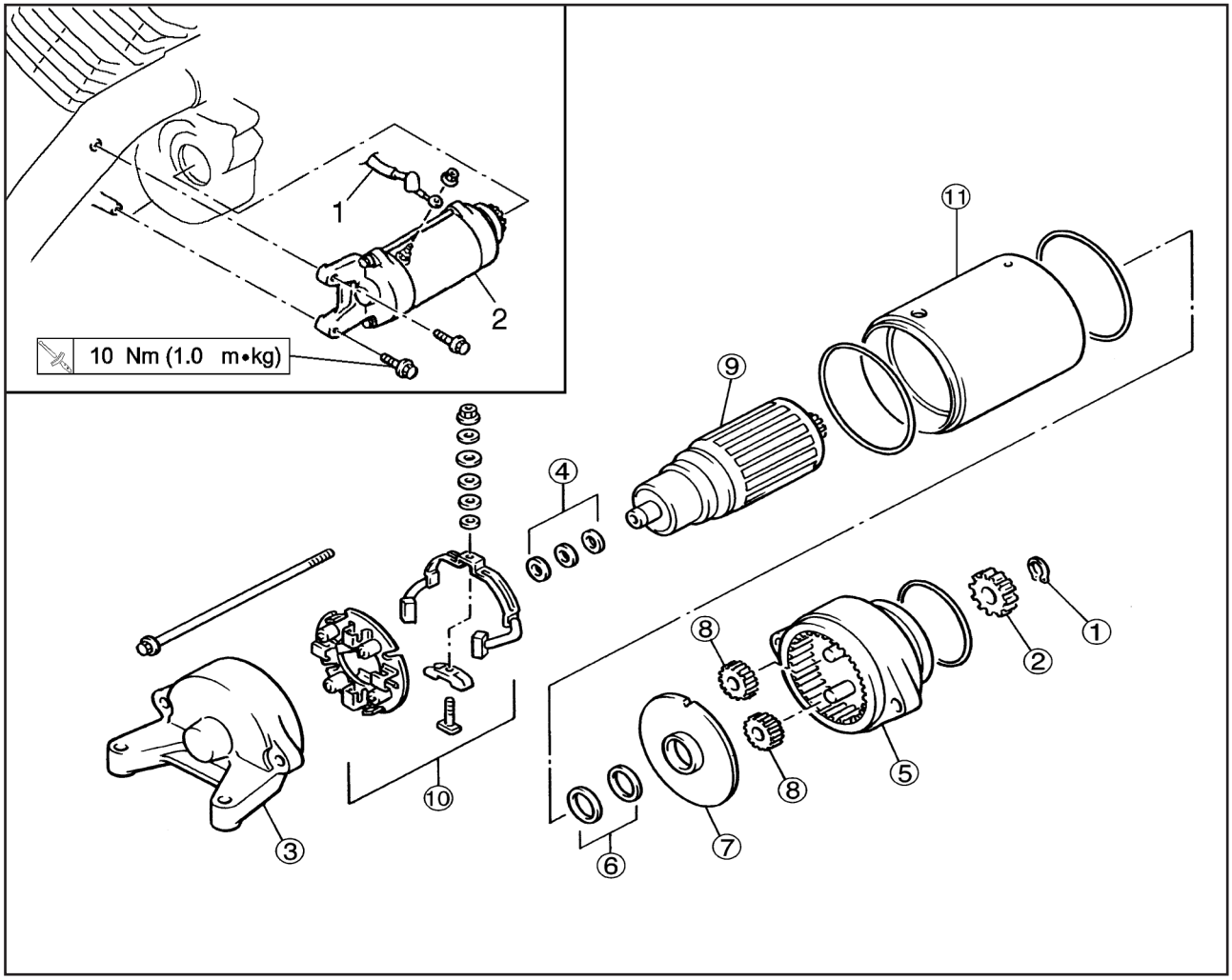
NO ⇩

Properly connect or repair the starting system’s wiring.

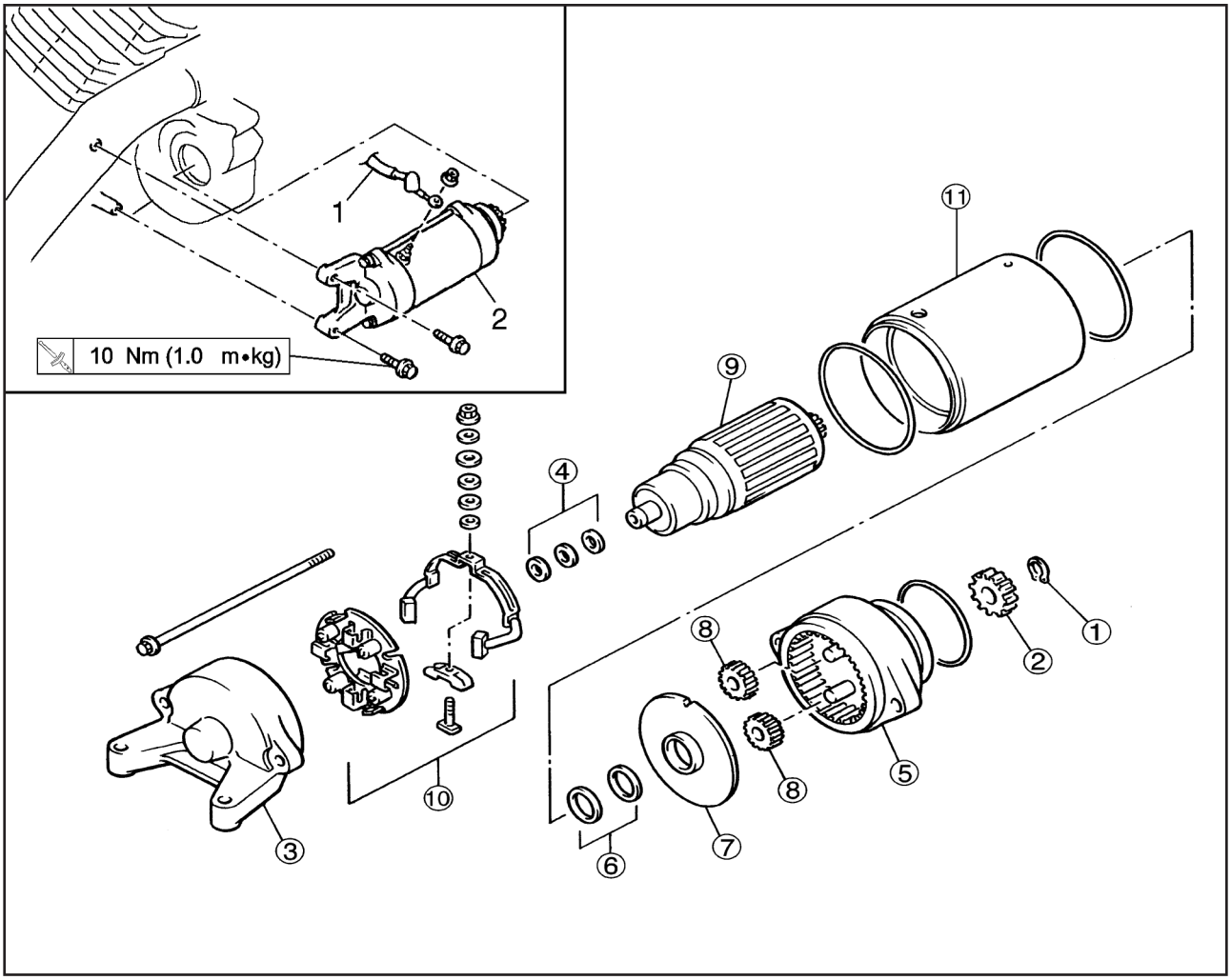
YES ⇩

The starting system circuit is OK.

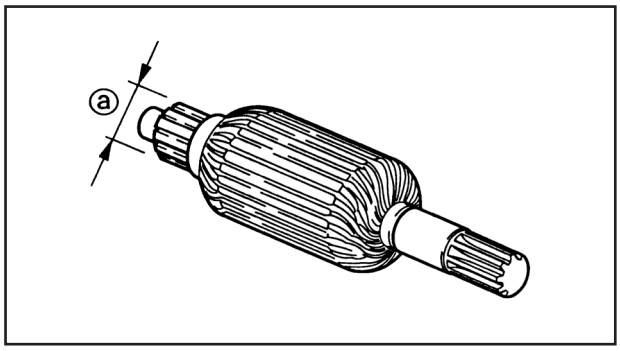
STARTER MOTOR

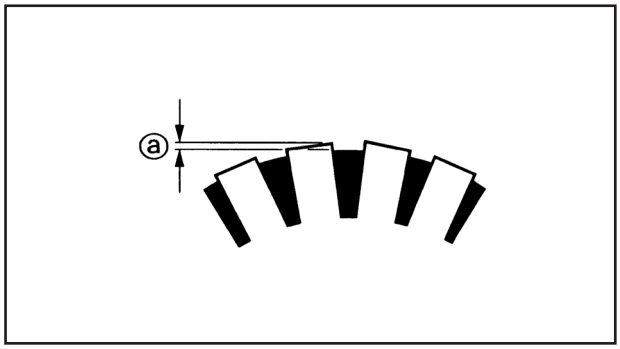


Order	Job name/Part name	Q'ty	Remarks
	Removing the starter motor		Remove the parts in the order listed.
1	Starter motor lead	1	
2	Starter motor assembly	1	
			For installation, reverse the removal procedure.
	Disassembling the starter motor		Disassembly the pats in the order listed.
①	Circlip	1	
②	Starter motor drive gear	1	
③	Starter motor rear cover	1	Refer to "Assembling the starter motor".
④	Washer set	1	
⑤	Starter motor front cover	1	Refer to "Assembling the starter motor".



Order	Job name/Part name	Q'ty	Remarks
⑥	Washer set	1	
⑦	End bracket	1	Refer to "Assembling the starter motor."
⑧	Planetary gears	2	
⑨	Armature assembly	1	
⑩	Brush holder/brush	1/1	Refer to "Assembling the starter motor."
⑪	Starter motor yoke	1	
			For assembly, reverse the disassembly procedure.





EAS00769

Checking the starter motor

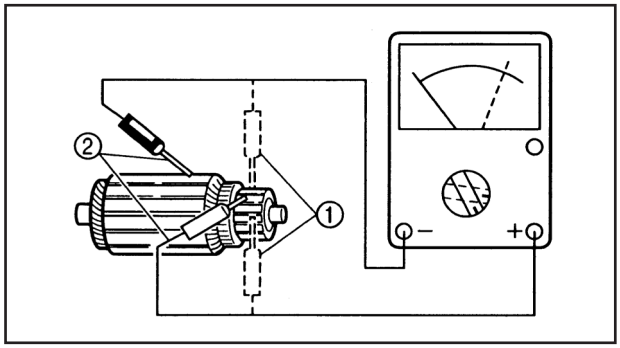
1. Check:
   - commutator
     Dirt → Clean with 600 grit sandpaper.
2. Measure:
   - commutator diameter ⓐ
     Out of specification → Replace the starter motor.

Min. commutator diameter
27 mm

3. Measure:
   - mica undercut ⓐ
     Out of specification → Scrape the mica to the proper measurement with a hacksaw blade which has been grounded to fit the commutator.

Mica undercut
0.7 mm

NOTE:
The mica must be undercut to ensure proper operation of the commutator.



4. Measure:
   - armature assembly resistances (commutator and insulation)
     Out of specification → Replace the starter motor.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

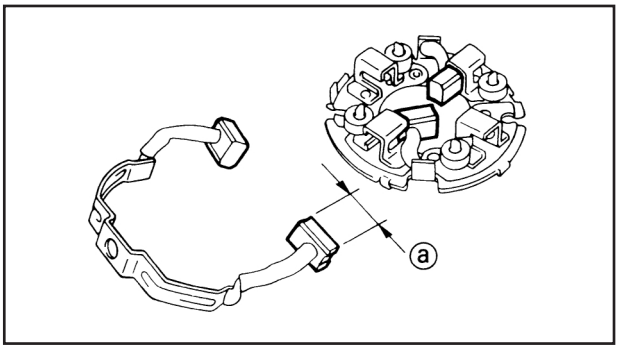
a. Measure the armature assembly resistances with the pocket tester.

Pocket tester
90890-03112

Armature assembly
Armature coil resistance ①
0.026 ~ 0.034 Ω at 20°C (68 °F)
Insulation resistance ②
Above 1 MΩ at 20°C (68 °F)

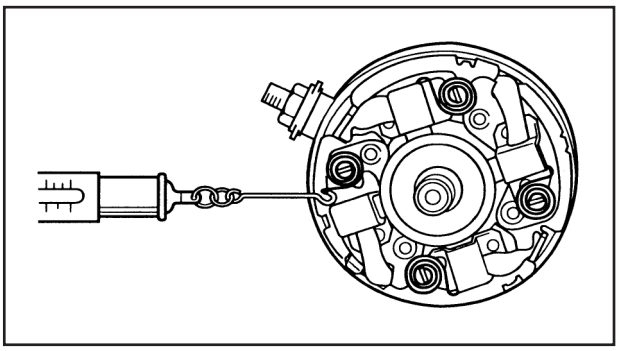
b. If any resistance is out of specification, replace the starter motor.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



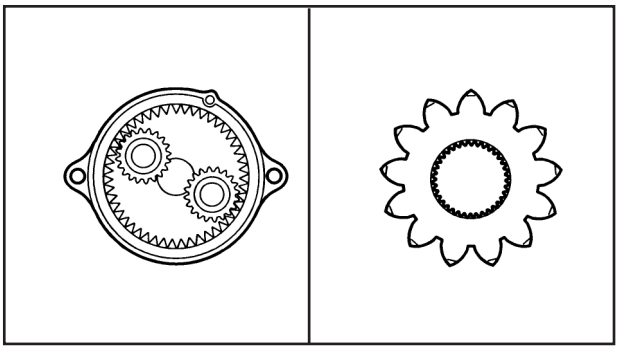
5. Measure:
   • brush length ⓐ
   Out of specification → Replace the brushes as a set.

Min. brush length
5 mm

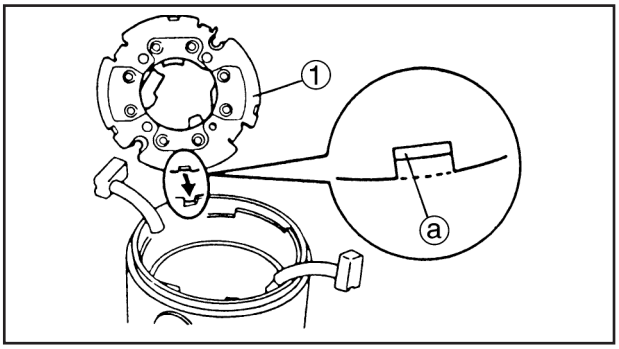


6. Measure:
   • brush spring force
   Out of specification → Replace the brush springs as a set.

Bruch spring force
7.65 ~ 10.01 N (780 ~ 1.020 g)



7. Check:
   • gear teeth
   Damage/wear → Replace the gear.
8. Check:
   • oil seal
   Damage/wear → Replace the defective part(-s).

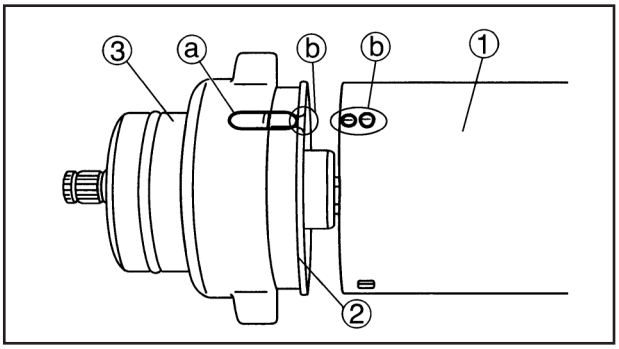


EAS00772

Assembling the starter motor

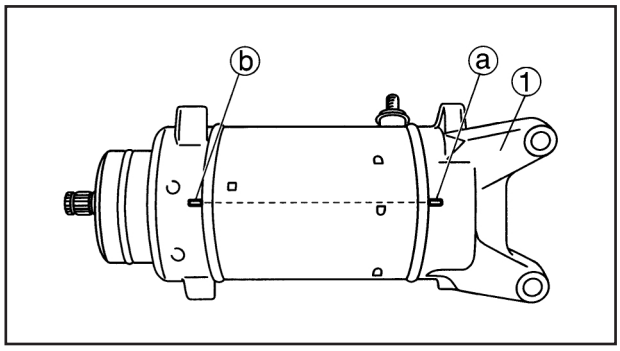
1. Install:
   • brush holder ①

NOTE:
Align the tab ⓐ on the brush holder with the slot in the starter motor rear cover.



2. Install:
   • starter motor yoke ①
   • end bracket ②
   • starter motor front cover ③

NOTE:
Align the projection ⓐ on the front cover with the slot ⓑ on the end cover and starter motor yoke.



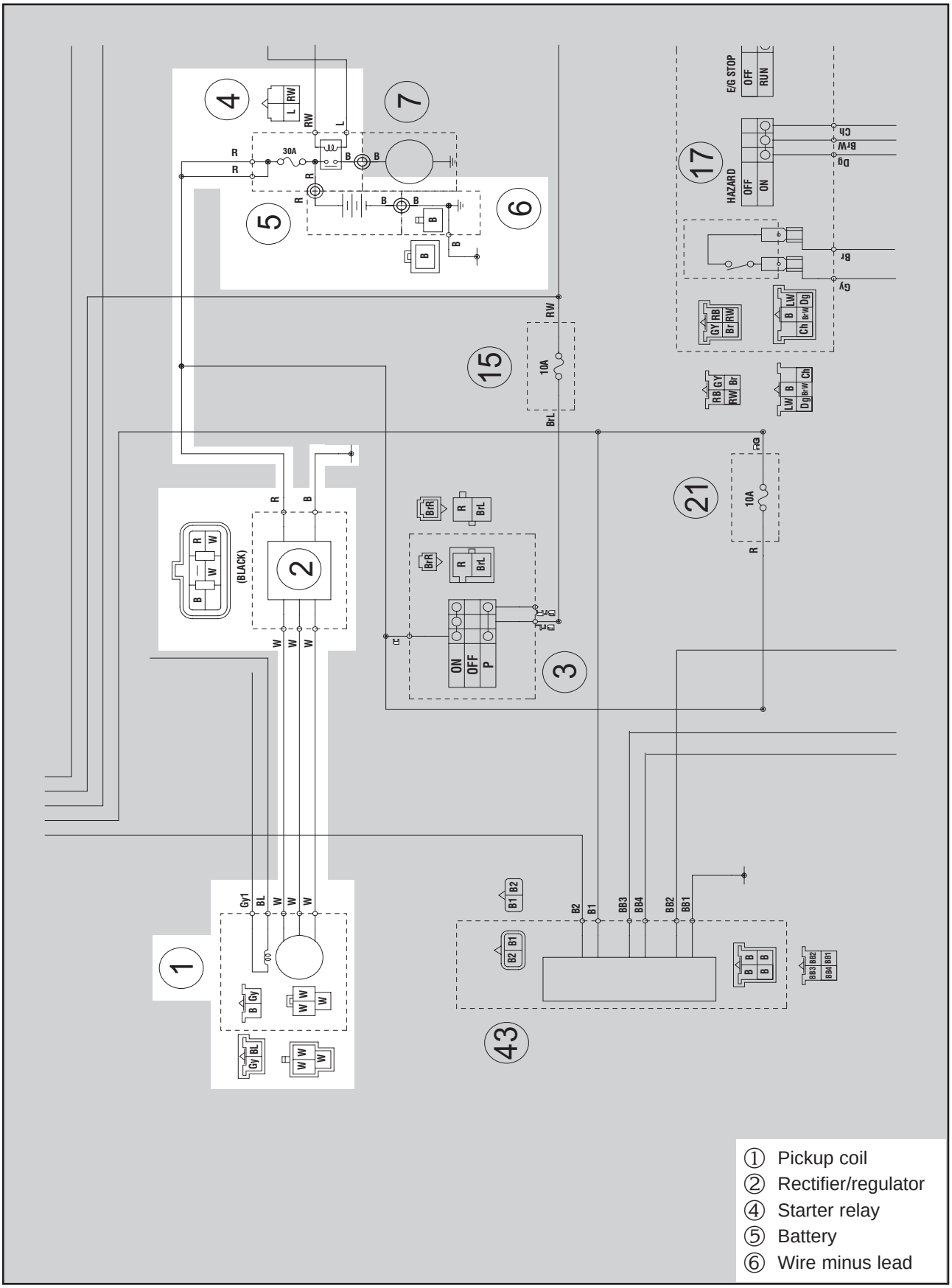
3. Install:
   • starter motor rear cover ①

NOTE:

Align the match marks ⓐ on the rear cover with the match marks ⓑ on the front cover.

CHARGING SYSTEM

CIRCUIT DIAGRAM



EAS00774

TROUBLESHOOTING

The battery is not being charged.

Check:
1. Main fuse
2. Battery
3. Charging voltage
4. Startor coil assembly resistance
5. Wiring (of the entire charging system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Seat
2) Side covers
3) Storage compartment/battery cover

- Troubleshoot with the following special tool(-s).

Engine tachometer
90890-03113
Pocket tester
90890-03112

EAS00738

1. Main fuse

- Check the main fuse for continuity.
  Refer to "CHECKING THE FUSES" in Chapter 3.
- Is the main fuse OK?

YES

NO → Replace the fuse.

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in Chapter 3.

Min. open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

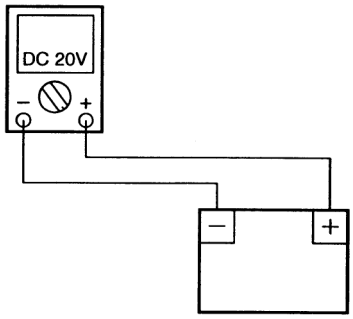
EAS00775

3. Charging voltage

- Connect the engine tachometer to the spark plug lead of cylinder #1.
- Connect the pocket tester (DC 20 V) to the battery as shown.

Tester positive probe →
battery positive terminal

Tester negative probe →
battery negative terminal



- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.

Charging voltage
14 V at 5,000 r/min

NOTE:
Make sure that the battery is fully charged.

- Is the charging voltage within specification?

NO ⇓

YES ⇩

The charging circuit is OK.

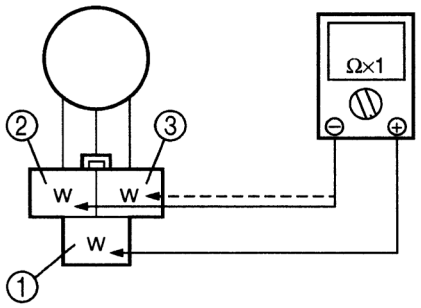
EAS00776

4. Stator coil assembly resistances

- Remove the left side cover.
- Connect the pocket tester (Ω × 1) to the stator coil assembly coupler as shown

Tester positive probe → White ①
Tester negative probe → White ②

Tester positive probe → White ①
Tester negative probe → White ③



- Measure the stator coil assembly resistances.

Stator coil resistance
0.36 ~ 0.44 Ω at 20°C (68 °F)

- Is the stator coil assembly OK?

YES ⇩

NO ⇓

Replace the stator coil assembly.

EAS00779

5. Wiring

- Check the wiring connections of the entire charging system.
  Refer to “CIRCUIT DIAGRAM”.
- Is the charging system’s wiring properly conected and without defects?

NO ⇓

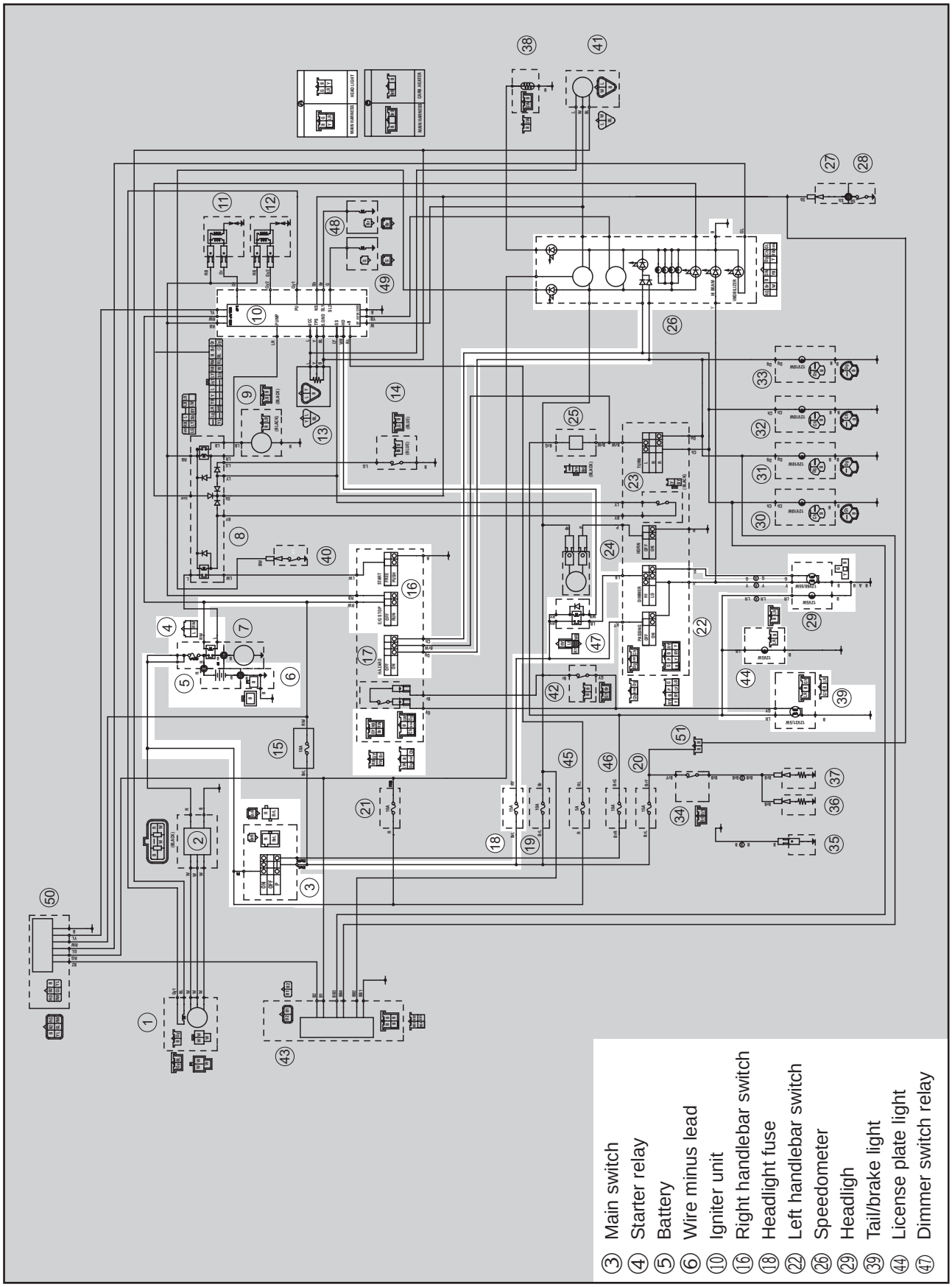
YES ⇩

Properly connect or repair the charging system’s wiring.

Replace the rectifier/ regulator.

LIGHTING SYSTEM

CIRCUIT DIAGRAM



EASB0033

TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, license plate light or meter light.

Check:
1. Main and headlight fuses
2. Battery
3. Main switch
4. Dimmer switch
5. Pass switch
6. Dimmer switch relay
7. Igniter unit
8. Wiring (of the entire charging system)

NOTE:

- Before troubleshooting, remove the following part(-s).

1) Seat
2) Side covers
3) Fuel tank (lift)
4) Cowling (lift forward)
5) Storage compartment/battery cover

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00738

1. Main and headlight fuses

- Check the main and headlight fuses for continuity.
  Refer to "CHECKING THE FUSES" in Chapter 3.
- Are the main and headlight fuses OK?

YES

NO → Replace the fuse(-s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in Chapter 3.

Min. open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES

NO → Replace the main switch.

EAS00784

4. Dimmer switch

- Check the dimmer switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the dimmer switch OK?

YES

NO → The dimmer switch is faulty. Replace the right handlebar switch.

EAS00786

5. Pass switch

- Check the pass switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the pass switch OK?

YES

NO

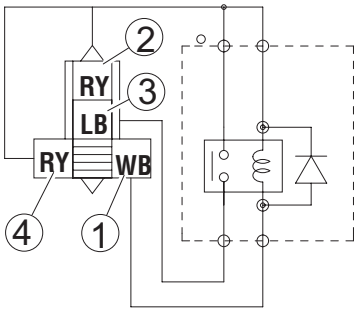
The pass switch is faulty. Replace the right handlebar switch.

6. Dimmer switch relay

- Disconnect the dimmer switch relay from the coupler.
- Connect the pocket tester ($\Omega \times 1$) and battery (12V) to the dimmer switch relay coupler.

Battery positive terminal → White/Black ①
Battery negative terminal → Red/Yellow ②

Tester positive probe → Blue/Black ③
Tester negative probe → Red/Yellow ④



- Does the dimmer switch relay have continuity between Blue/Black and Red/Yellow?

YES

NO

Replace the dimmer switch relay.

7. Igniter unit

- Disconnect the igniter unit from the coupler and connect a new one.
- Is the lighting system’s OK ?

YES

NO

Replace the igniter unit.

The igniter unit is OK.

EAS00787

8. Wiring

- Check the entire lighting system’s wiring.
  Refer to “CIRCUIT DIAGRAM”.
- Is the lighting system’s wiring properly connected and without defects?

YES

NO

Check the condition of each of the lighting system’s circuits.
Refer to “CHECKING THE LIGHTING SYSTEM”.

Properly connect or repair the lighting system’s wiring.

EAS00788

CHECKING THE LIGHTING SYSTEM

1. The headlight and the high beam indicator light fail to came on.

1. Headlight bulb and socket

- Check the headlight bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the headlight bulb and socket OK?

YES

NO

Replace the headlight bulb, socket or both.

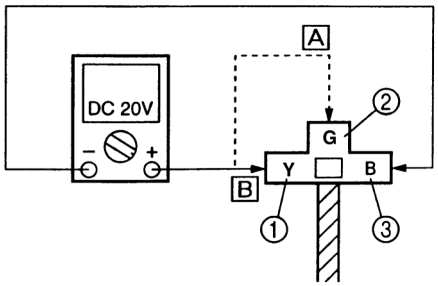
2. Voltage

- Connect the pocket tester (DC 20 V) to the headlight and high beam indicator light couplers as shown.

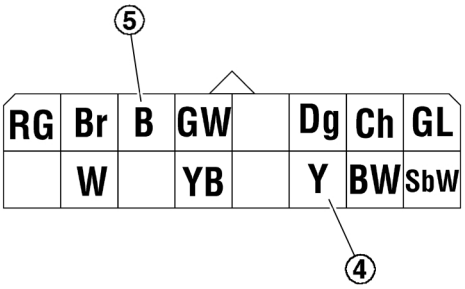
A When the dimmer switch is set to "≡D"
B When the dimmer switch is set to "≡D"

Headlight
Tester positive probe → Yellow ① or Green ②
Tester negative probe → Black ③
High beam indicator light
Tester positive probe → Yellow ④
Tester negative probe → Black ⑤

Headlight coupler (wire harness side)



- Set the main switch to "ON".
- Set the dimmer switch to "≡D" or "≡D".



- Measure the voltage (12 V) of Yellow ① or Green ② on the headlight coupler (headlight side).
- Measure the voltage (12V) of Yellow ④ on the meter assembly coupler.
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the headlight coupler is faulty and must be repaired.

EAS00789

2. A meter light fails to come on.

1. Meter light bulb and socket.

- Check the meter light bulb and socket for continuity
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the meter light bulb and socket OK?

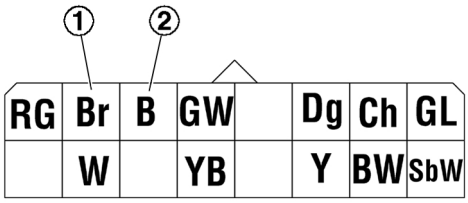
YES

NO → Replace the meter light bulb, socket or both.

2. Voltage

- Connect the pocket tester (20 V) to the meter assembly coupler (wire harness side) as shown.

Tester positive probe → Brown ①
Tester negative probe → Black ②



- Set the main switch to "ON".
- Measure the voltage (12 V) of Brown ① on the meter assembly coupler (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

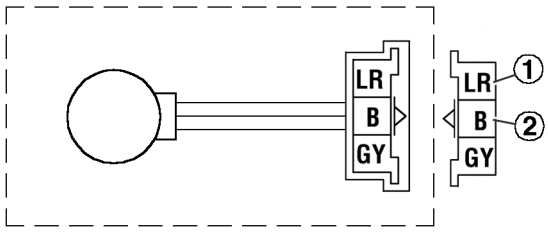
EAS00790

3. A tail/brake light fails to come on.

1. Tail/brake light bulb and socket
• Check the tail/brake light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”. • Are the tail/brake light bulb and socket OK?

YES

NO → Replace the tail/brake light bulb, socket or both.

2. Voltage
• Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.
Tester positive probe → Blue/Red ① **Tester negative probe → Black ②**

• Set the main switch to “ON”. • Measure the voltage (12 V) of Blue/Red ① on the tail/brake light coupler (wire harness side). • Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

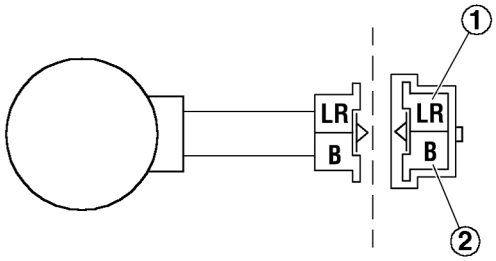
EASB0034

4. The license plate light fails to come on.

1. License plate light bulb and socket
• Check the license plate light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”. • Are the license plate light bulb and socket OK?

YES

NO → Replace the license plate light bulb, socket or both.

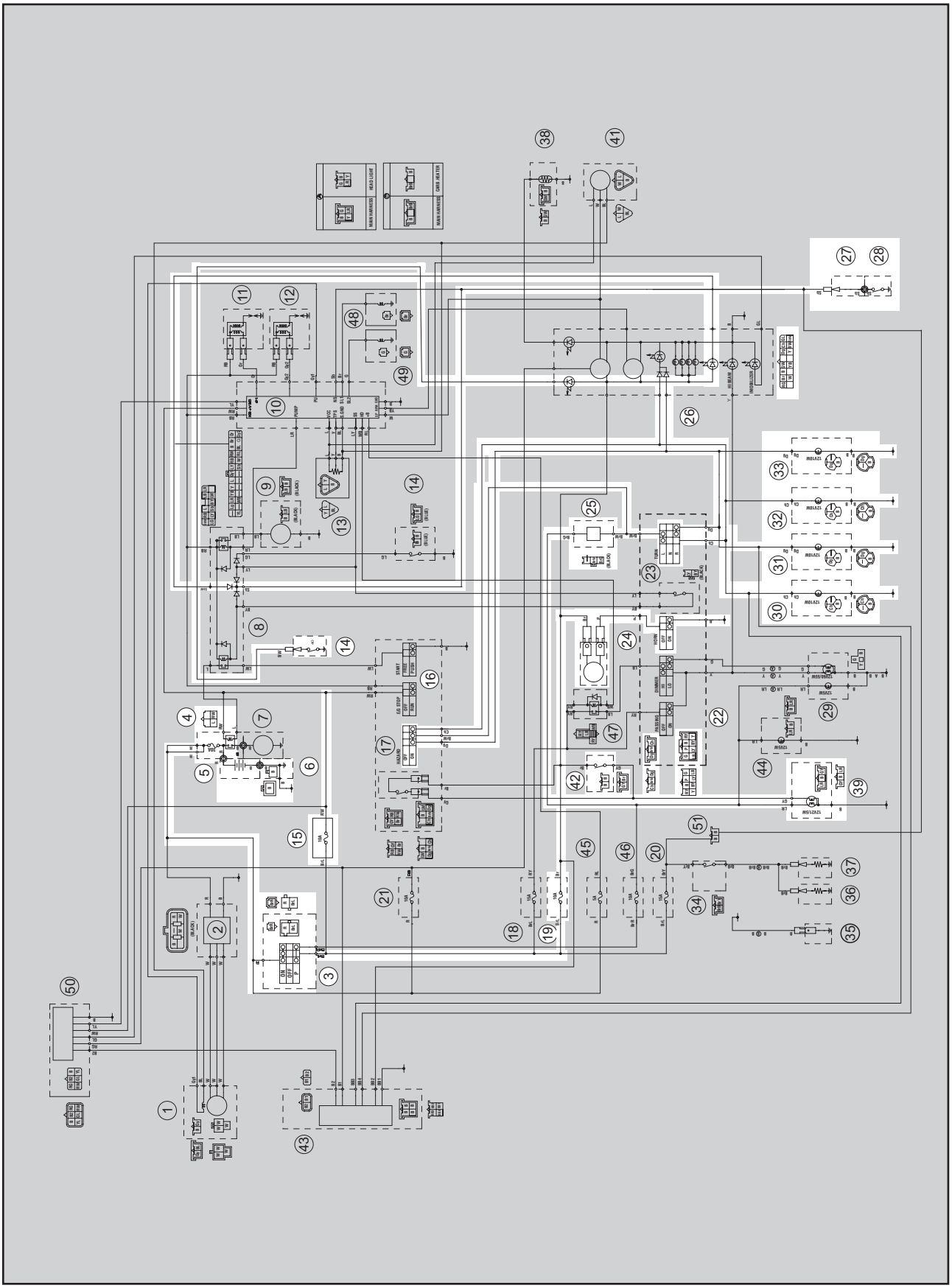
2. Voltage
• Connect the pocket tester (DC 20 V) to the license plate light coupler (wire harness side) as shown.
Tester positive probe → Blue/Red ① **Tester negative probe → Black ②**

• Set the main switch to “ON”. • Measure the voltage (12 V) of Blue/Red ① on the license plate light coupler (wire harness side). • Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the license plate light coupler is faulty and must be repaired.

SIGNALING SYSTEM

CIRCUIT DIAGRAM



③ Main switch
④ Starter relay
⑤ Battery
⑥ Wire minus lead
⑮ Ignition fuse
⑯ Right handlebar switch
⑰ Front brake switch
⑲ Signal fuse
㉒ Left handlebar switch
㉔ Horn
㉕ Flasher relay
㉖ Multi-function display
㉗ Neutral switch lead
㉘ Neutral switch
㉚ Front turn signal light (L)
㉛ Front turn signal light (R)
㉜ Rear turn signal light (L)
㉝ Rear turn signal light (R)
㉟ Tail/brake light
㊵ Oil level gauge
㊷ Rear brake switch

EASB0035

TROUBLESHOOTING

• Any of the following fail to light: turn signal light, brake light or an indicator light.
• The horn fails to sound.

Check:
1. Main and signaling system fuses
2. Battery
3. Main switch
4. Hazard switch
5. Wiring (of the entrire signaling system)

NOTE:
• Before troubleshooting, remove the following part(-s):
1) Seat
2) Side covers
3) Fuel tank (lift)
4) Cowling (lift forward)
5) Storage compartment/battery cover
• Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00738

1. Main, ignition and signaling system fuses

• Check the main, ignition and signaling system fuses for continuity.
Refer to “CHECKING THE FUSES” in Chapter 3.
• Are the main, ignition and signaling system fuses OK?

YES

NO → Replace the fuse(-s).

EAS00739

2. Battery

• Check the condition of the battery.
Refer to “CHECKING AND CHARGING THE BATTERY” in Chapter 3.

Min. open-circuit voltage
12.8 V or more at 20 °C (68 °F)

• Is the battery OK?

YES

NO →
• Clean the battery terminals.
• Recharge or replace the battery.

EAS00749

3. Main switch

• Check the main switch for continuity.
Refer to “CHECKING THE SWITCHES”.
• Is the main switch OK?

YES

NO → Replace the main switch.

4. Hazard switch.

• Check the hazard switch for continuity.
Refer to “CHECKING THE SWITCHES”.
• Is the hazard switch OK?

YES

NO → Replace the hazard switch.

EAS00795

5. Wiring

- Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the signaling system's wiring properly connected and without defects?

YES → Check the condition of each of the signaling system's circuits. Refer to "CHECKING THE SIGNALING SYSTEM".

NO → Properly connect or repair the signaling system's wiring.

EAS00796

CHECKING THE SIGNALING SYSTEM

1. The horn fails to sound.

1. Horn switch

- Check the horn switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the horn switch OK?

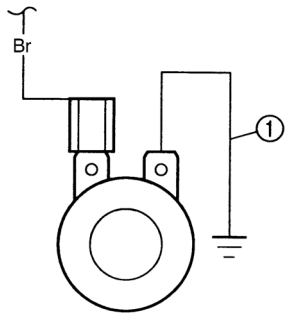
YES

NO → Replace the left handlebar switch.

2. Voltage

- Connect the pocket tester (DC 20 V) to the horn connector at the horn terminal as shown.

Tester positive probe → Brown ①
Tester negative probe → Ground



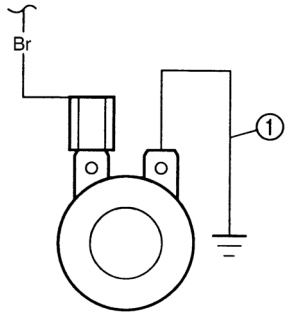
- Set the main switch to "ON".
- Measure the voltage (12 V) of Brown at the horn terminal.
- Is the voltage within specification?

YES

NO → The wiring circuit from the main switch to the horn connector is faulty and must be repaired.

3. Horn

- Disconnect the Black connector at the horn terminal.
- Connect a jumper lead ① to the horn terminal and Ground the jumper lead.
- Set the main switch to "ON".
- Does the horn sound?



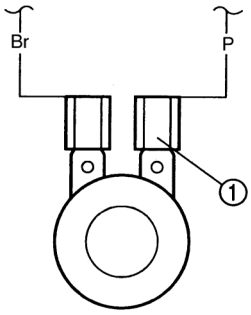
NO

YES → The horn is OK.

4. Voltage

• Connect the pocket tester (DC 20 V) to the horn connecter at the black terminal as shown.

Tester positive probe → Black ①
Tester negative probe → Ground



• Set the main switch to "ON".
• Measure the voltage (12 V) of Black ① at the horn terminal.
• Is the voltage within specification?

YES → Repair or replace the horn.

NO → Replace the horn.

EAS00797

2. A tail/brake light fails to come on.

1. Tail/brake light bulb and socket

• Check the tail/brake light bulb and socket for continuity.
Refer to "CHECKING THE BULBS AND BULB SOCKETS".
• Are the tail/brake light bulb and socket OK?

YES

NO → Replace the tail/brake lightbulb, socket or both.

2. Brake light switches

• Check the brake light switches for continuity.
Refer to "CHECKING THE SWITCHES".
• Is the brake light switch OK?

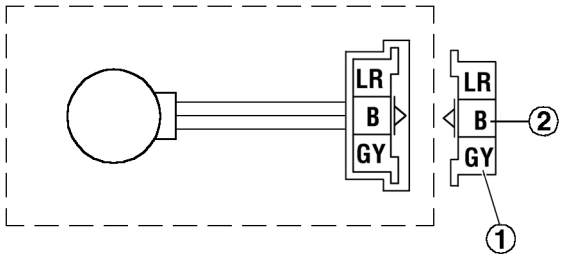
YES

NO → Replace the brake light switch.

3. Voltage

• Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Tester positive probe → Green/Yellow ①
Tester negative probe → Black ②



• Set the main switch to "ON".
• Pull in the brake lever or push down on the brake pedal.
• Measure the voltage (12 V) of Yellow at the tail/brake light coupler (wire harness side).
• Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00799

3. A turn signal light, turn signal indicator light or both fail to blink.

1. Turn signal light bulb and socket

- Check the turn signal light bulb and socket for continuity.
  Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the turn signal light bulb and socket OK?

YES

NO → Replace the turn signal light bulb, socket or both.

2. Turn signal switch

- Check the turn signal for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the turn signal switch OK?

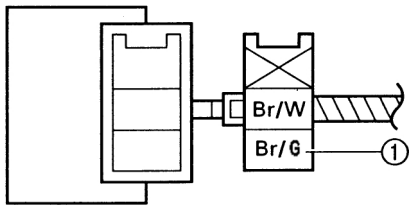
YES

NO → Replace the left handlebar switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the flasher relay coupler (wire harness side) as shown.

Tester positive probe → Brown/Green ①
Tester negative probe → Ground



- Set the main switch to “ON”.
- Measure the voltage (12 V) of Brown/Green ① at the flasher relay coupler (wire harness side).
- Is the voltage within specification?

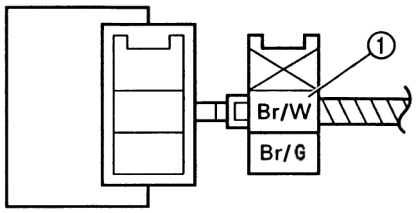
YES

NO → The wiring circuit from the main switch to the flasher relay coupler (flasher relay side) is faulty and must be repaired.

4. Voltage

- Connect the pocket tester (DC 20 V) to the flasher relay coupler (wire harness side) as shown.

Tester positive probe → Brown/White ①
Tester negative probe → Ground



- Set the main switch to "ON".
- Set the turn signal switch to "⇦" or "⇨".
- Measure the voltage (12 V) of Brown/White at the flasher relay coupler (wire harness side).
- Is the voltage within specification?

YES

NO

The flasher relay is faulty and must be replaced.

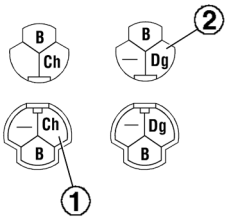
5. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal light connectors or the meter assembly coupler (wire harness side) as shown.

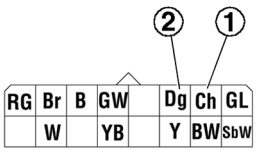
A Turn signal light
B Turn signal indicator light

Left turn signal light
Tester positive probe → Chocolate ①
Tester negative probe → Ground
Right turn signal light
Tester positive probe → Dark green ②
Tester negative probe → Ground

A



B



- Set the main switch to "ON".
- Set the turn signal switch to "⇦" or "⇨".
- Measure the voltage (12 V) of Chocolate ① or Dark green ② at the turn signal light connector (wire harness side).
- Is the voltage within specification?

YES

NO

This circuit is OK.

The wiring circuit from the turn signal switch to the turn signal light connector is faulty and must repaired.

EAS00800

4. The neutral indicator light fails to come on.

1. Neutral indicator light bulb and socket

- Check the neutral indicator light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the neutral indicator light bulb and socket OK?

YES

NO

Replace the neutral indicator light bulb, socket or both.

2. Neutral switch

- Check the neutral switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

YES

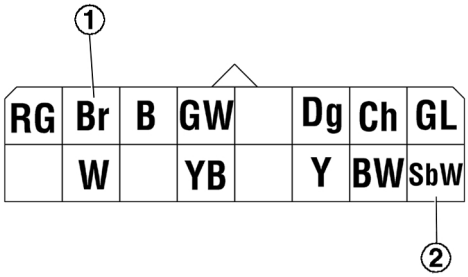
NO

Replace the neutral switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Tester positive probe → Brown ①
Tester negative probe → Sky Blue/White ②



- Set the main switch to "ON".
- Measure the voltage (12 V) of Brown ① and Sky blue/White ② at the meter assembly coupler.
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the meter light bulb coupler is faulty and must be repaired.

EASB0036

5. The oil level warning light fails to come on.

1. Oil level warning light bulb and socket

- Check the oil level warning light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS"
- Are the oil level warning light bulb and socket OK?

YES → Replace the oil level warning light bulb, socket or both.

NO

2. Oil level switch

- Drain the engine oil and remove the oil level switch from the oil pan.
- Check the oil level switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the oil level switch OK?

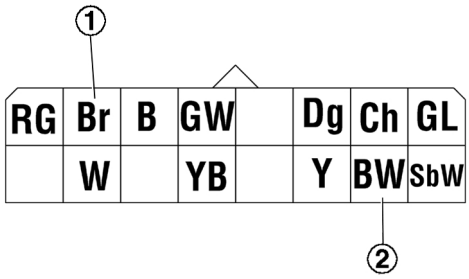
YES

NO → Replace the oil level switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Tester positive probe → Red/White ①
Tester negative probe → Black/White ②



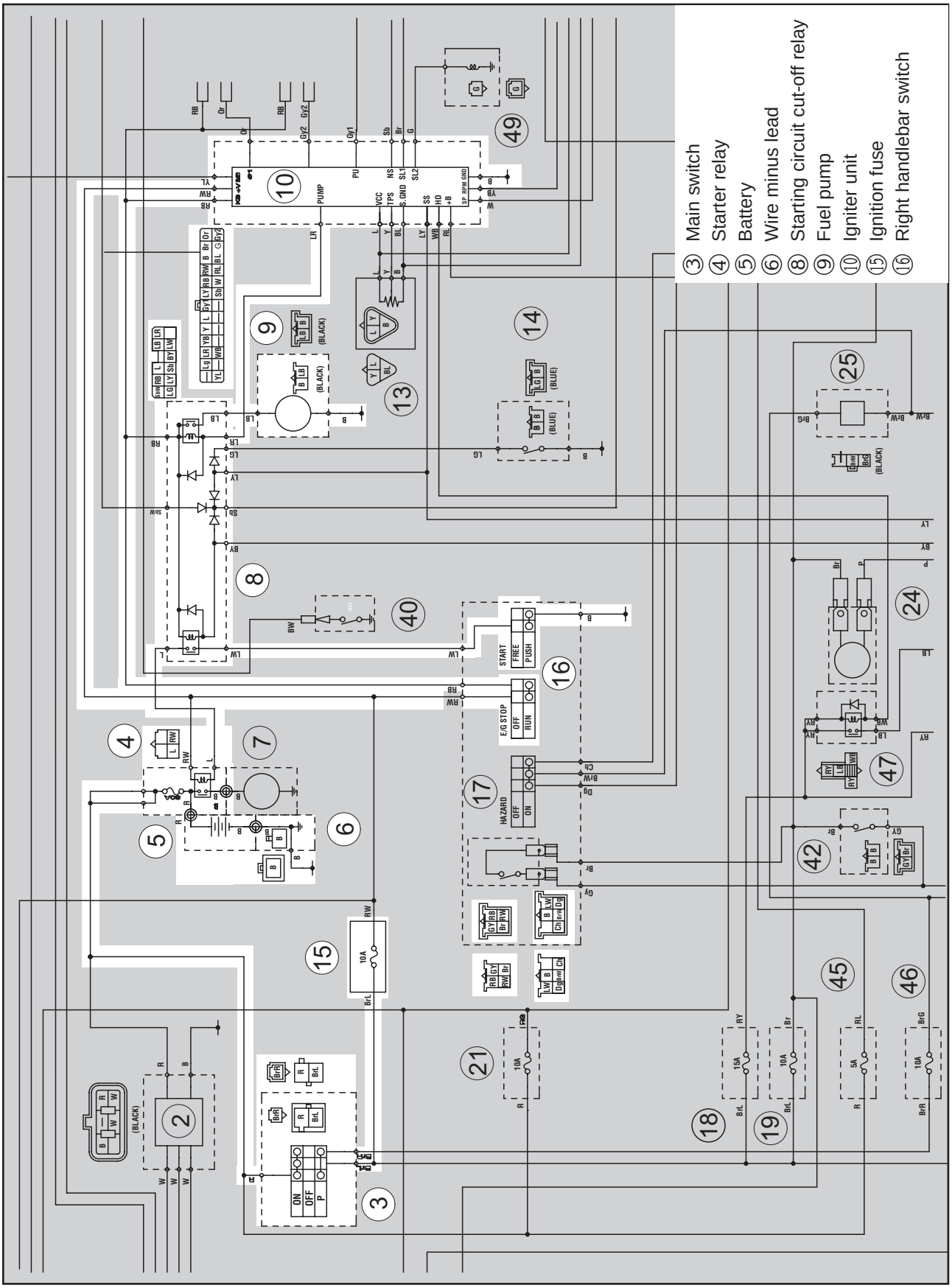
- Set the main switch to "ON".
- Measure the voltage (12 V) of Brown ① and Black/White ② at the meter assembly coupler.
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

FUEL PUMP SYSTEM

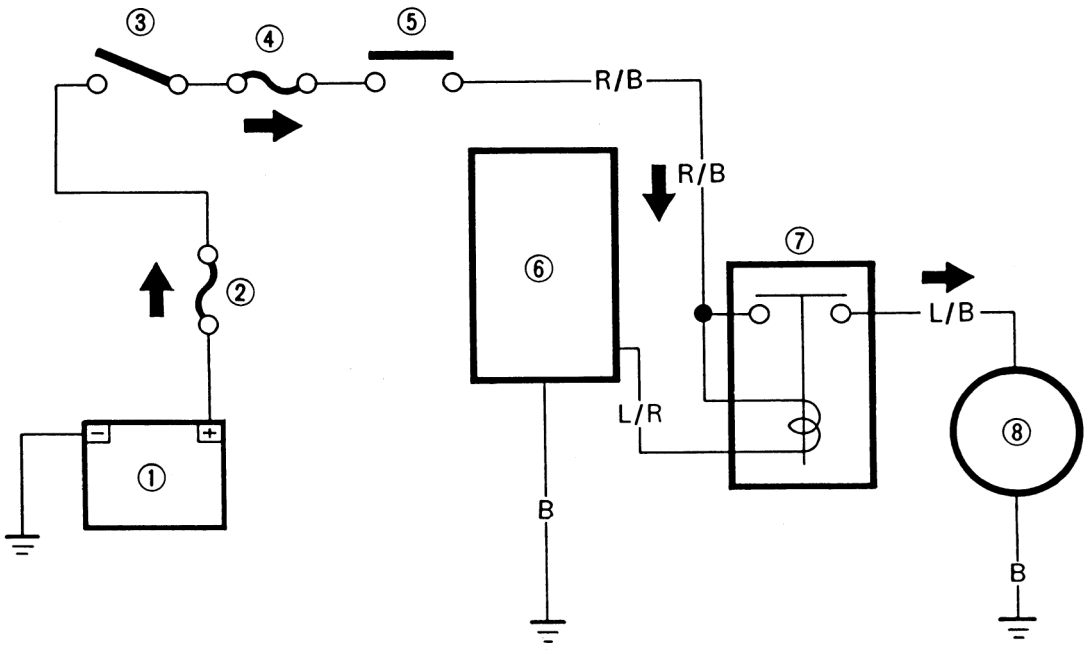
CIRCUIT DIAGRAM



EB808010
FUEL PUMP CIRCUIT OPERATION

The fuel pump circuit consists of the fuel pump relay, fuel pump, engine stop switch and ignitor unit. The ignitor unit includes the control unit for the fuel pump.

① Battery
② Main fuse
③ Main switch
④ Ignition fuse
⑤ Engine stop switch
⑥ Ignitor unit
⑦ Fuel pump relay
⑧ Fuel pump



EASB0037

TROUBLESHOOTING

The fuel pump fails to operate.

Check:
1. Main, and ignition fuses
2. Battery
3. Main switch
4. Engine stop switch
5. Starting circuit cutoff relay (fuel pump relay)
6. Fuel pump
7. Wiring (of the entire charging system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Seat
2) Side covers
3) Fuel tank (lift)
4) Storage compartment/battery cover

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00738

1. Main and ignition fuses

- Check the main and ignition fuses for continuity.
  Refer to "CHECKING THE FUSES" in Chapter 3.
- Are the main and ignition fuses OK?

YES ⇩

NO ⇩

Replace the fuse(-s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in Chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

YES ⇩

NO ⇩

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES ⇩

NO ⇩

Replace the main switch.

EAS00750

4. Engine stop switch

- Check the engine stop switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?

YES ⇩

NO ⇩

Replace the right handlebar switch.

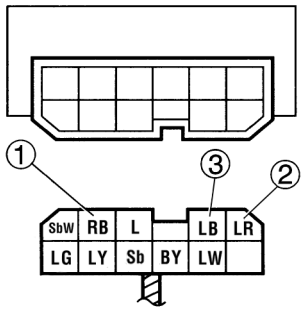
EB803023

5. Starting circuit cutoff relay (fuel pump relay)

- Remove the relay unit from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the relay unit terminals.

Battery (+) terminal → Red/Black terminal ①
Battery (–) terminal → Blue/Red terminal ②

Tester (+) lead → Red/Black terminal ①
Tester (–) lead → Blue/Black terminal ③



- Does the fuel pump relay have continuity between Red/Black and Blue/Black?

YES

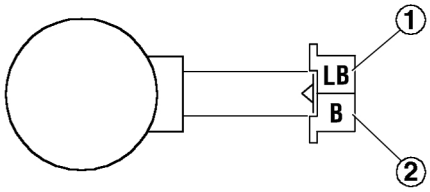
NO → Replace the starting circuit cutoff relay.

EB808021

6. Fuel pump resistance

- Disconnect the fuel pump coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the fuel pump coupler terminals.

Tester (+) lead → Blue/Black terminal ①
Tester (–) lead → Black terminal ②



- Measure the fuel pump resistance.

Fuel pump resistance:
1.6 ~ 2.2 Ω at 20 °C (68 °F)

Is the fuel pump OK?

YES

NO → Replace the fuel pump.

7. Wiring

- Check the entire fuel pump system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the fuel pump system's wiring properly connected and without defects?

NO → Properly connect or repair the fuel pump system's wiring.

YES → Replace the ignitor unit.

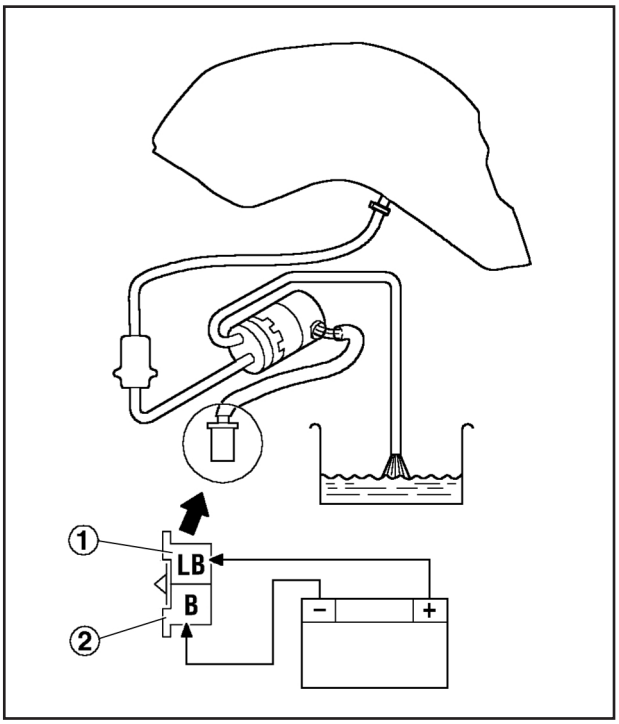
EASB0038

FUEL PUMP TEST

⚠ WARNING

Gasoline is extremely flammable and under certain circumstances there can be a danger of an explosion or combustion. Be extremely careful and note the following points:

- **Stop the engine before refuelling.**
- **Do not smoke and keep away from open flames, sparks, or any other source of fire.**
- **Take care not to spill gasoline. If you do accidentally spill some, wipe it up immediately with dry rags.**
- **If gasoline touches the engine when the engine is still hot, there is a danger of combustion. Make sure that the engine is completely cool before performing the following test.**



1. Check:
   - Fuel pump operation

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Fill up the fuel tank.
b. Put the end of the fuel hose into an open container.
c. Connect the battery (12 V) to the fuel pump coupler terminals.

Battery (+) lead → Blue/Black terminal ①
Battery (–) lead → Black terminal ②

d. Operate the engine starter to open the vacuum fuel cock.
e. If fuel flows out from the fuel hose, the fuel pump is good. If not, replace the fuel pump assembly.

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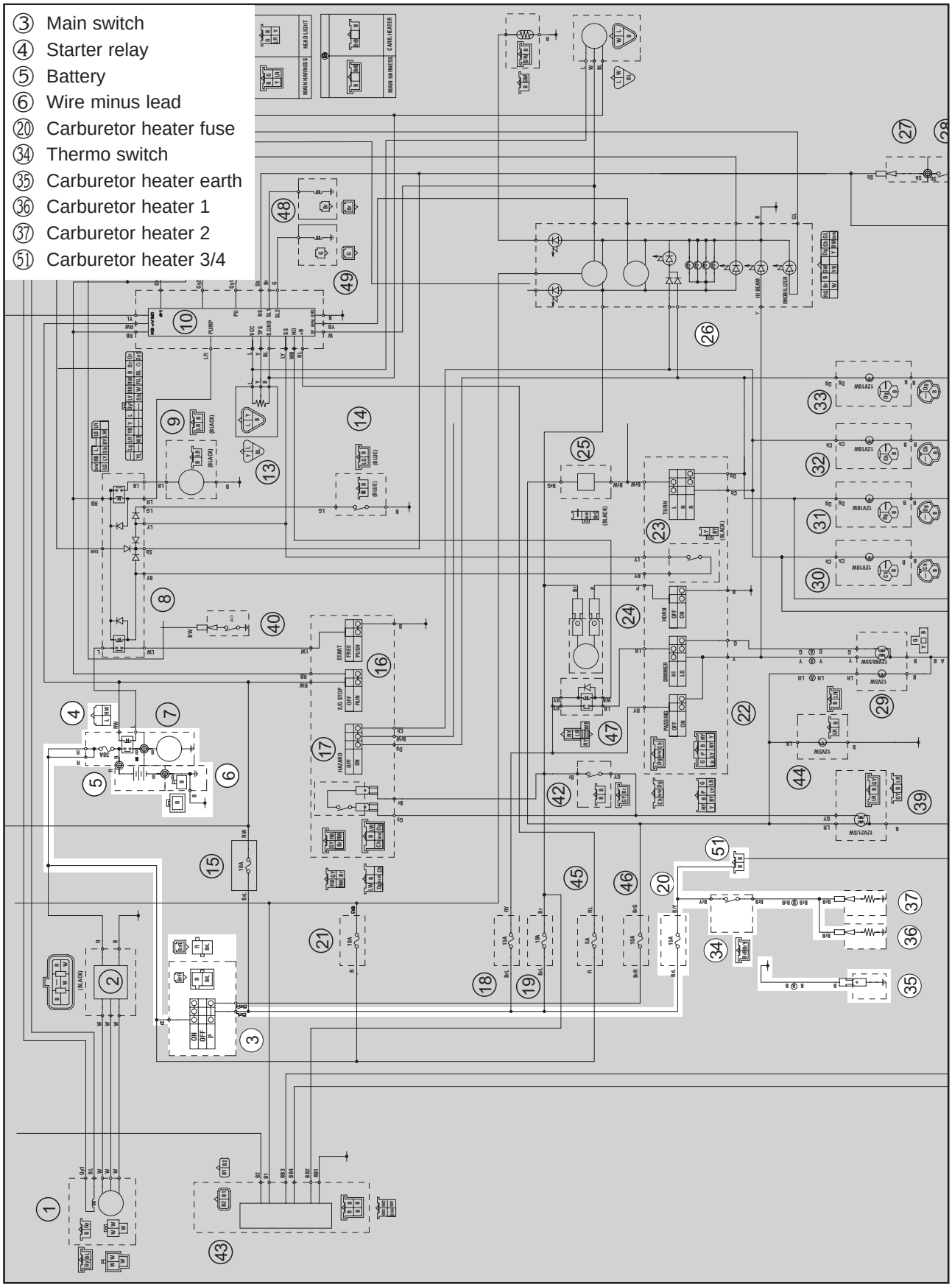
CARBURETOR HEATER SYSTEM

CIRCUIT DIAGRAM



EASB0039

TROUBLESHOOTING

The carburetor heater fails to operate.

Check:
1. Main and carburetor heater fuses
2. Battery
3. Main switch
4. Thermo
5. Carburetor heater
6. Wiring (of the entire charging system)

NOTE:
- Before troubleshooting, remove the following part(-s):

1) Seat
2) Side covers
3) Fuel tank (lift)
4) Storage compartment/battery cover

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112

EAS00738

1. Main and carburetor heater fuses

- Check the main and carburetor heater fuses for continuity.
  Refer to "CHECKING THE FUSES" in Chapter 3.
- Are the main, and carburetor heater fuses OK?

YES → NO

Replace the fuse(-s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in Chapter 3.

Open-circuit voltage
12.8 V or more at 20 °C (68 °F)

- Is the battery OK?

YES → NO

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES → NO

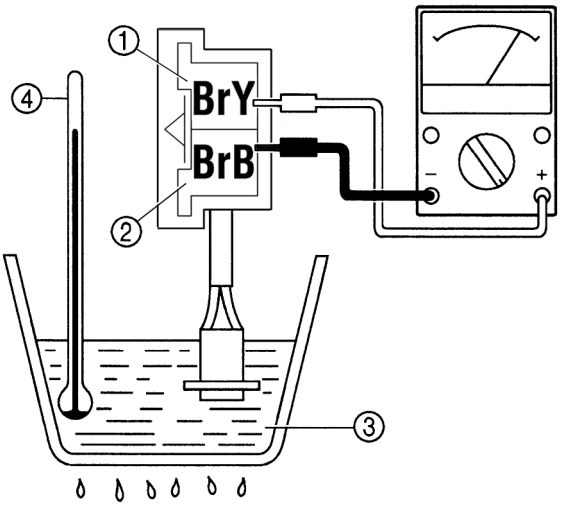
Replace the main switch.

EASB0040

4. Thermo switch

- Remove the thermo switch from the thermo switch plate.
- Connect the pocket tester to the thermo switch lead.

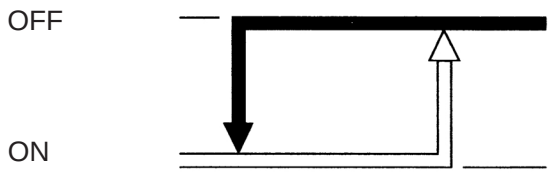
Tester (+) lead →
Brown/Yellow terminal ①
Tester (–) lead →
Brown/Black ②



• Immerse the thermo switch in the water ③.
• Check the thermo switch for continuity. Note the temperatures while heating the water with the temperature gauge ④.

Test step	Water temperature	Good condition
1	Less than 23 ± 3 °C	O
2	More than 23 ± 3 °C	×
3	More than 12 ± 4 °C	×
4	Less than 12 ± 4 °C	O

Test 1 & 2: Heat-up test
Test 3 & 4: Cool-down test
O **: Continuity** × **: No continuity**



• Is the thermo switch OK?

YES

NO

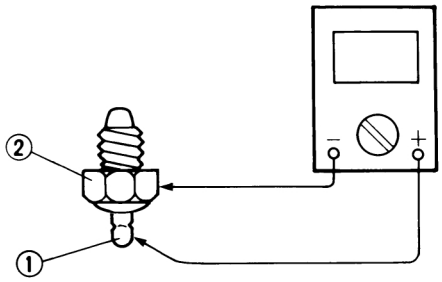
Replace the thermo switch.

EASB0041

5. Carburetor heater

• Remove the carburetor heater from the carburetor body.
• Connect the pocket tester to the carburetor heater.

Tester (+) lead → Heater terminal ①
Tester (–) lead → Heater body ②



• Measure the heater resistance.

Carburetor heater resistance:
12 V 30 W: 6 ~ 10 Ω at 20 °C (68 °F)

• Is the carburetor heater OK?

YES

NO

Replace the carburetor heater.

EASB0042

6. Wiring

• Check the entire carburetor heater system's wiring.
Refer to "CIRCUIT DIAGRAM".
• Is the carburetor heater system's wiring properly connected and without defects?

NO

YES

Properly connect or repair the carburetor heater system's wiring.

The carburetor heater system circuit is OK.

TROUBLESHOOTING

NOTE:

The following guide for troubleshooting does not cover all the possible causes of problems. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for inspection, adjustment and replacement of parts.

STARTING FAILURE/HARD STARTING

ELECTRICAL SYSTEM

Immobilizer system

- Refer to "TROUBLESHOOTING" of immobilizer system in chapter "ELECTRICAL" of this manual.

Spark plug

- Improper plug gap
- Worn electrodes
- Wire between terminals severed
- Improper heat range
- Faulty spark plug cap

Ignition coil

- Broken or shorted primary/secondary
- Faulty spark plug lead
- Broken body

Full-transistor system

- Faulty ignitor unit
- Faulty pickup coil

Switch and wiring

- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty start switch
- Faulty sidestand switch
- Faulty clutch switch

Starter motor

- Faulty starter motor
- Faulty starter relay
- Faulty relay unit (starting circuit cut-off relay)
- Faulty starter clutch

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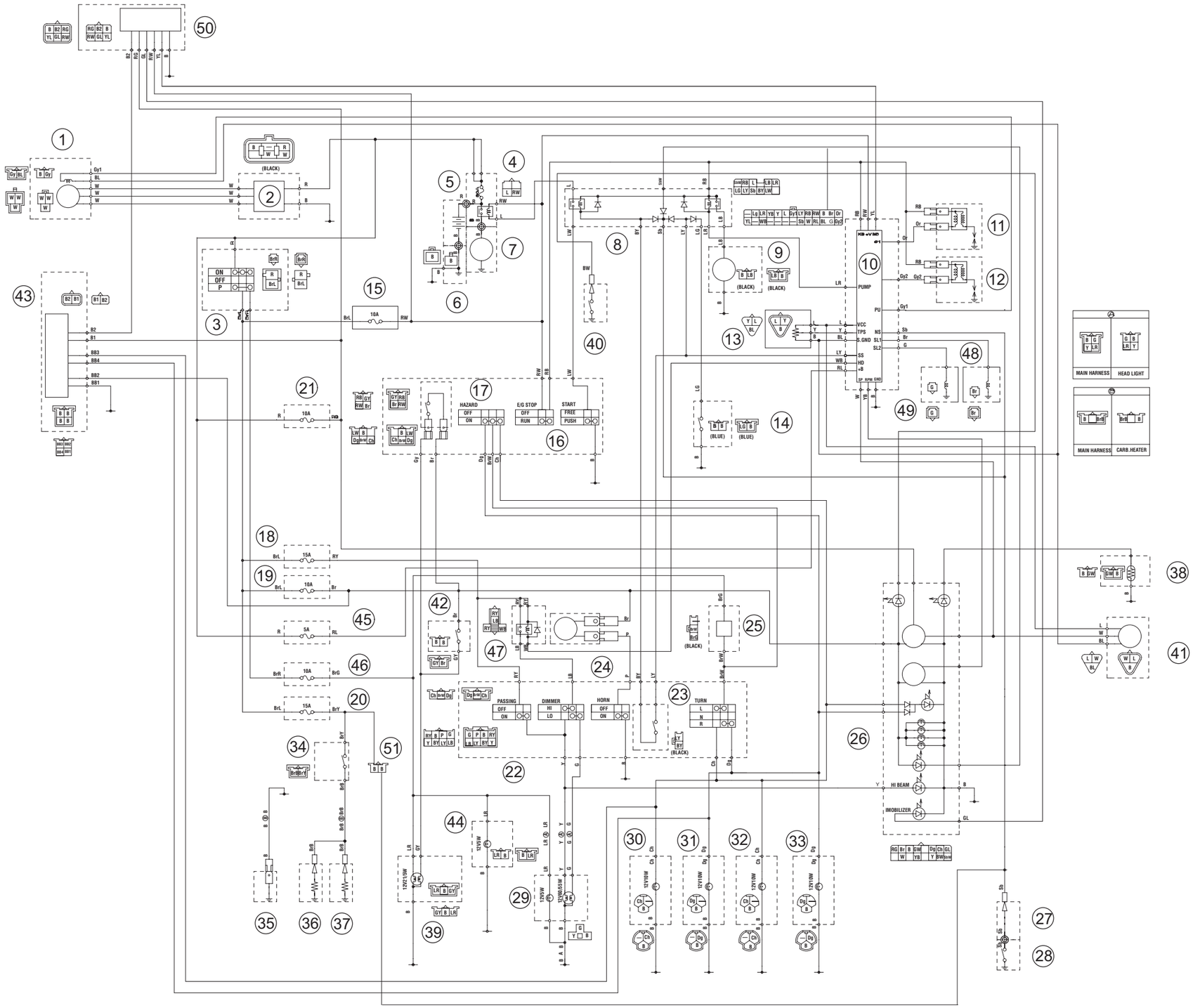
BT1100 WIRING DIAGRAM



WIRING DIAGRAM

① Pickup coil
② Rectifier/regulator
③ Main switch
④ Starter relay
⑤ Battery
⑥ Wire minus lead
⑦ Starter motor
⑧ Starting circuit cut-off relay
⑨ Fuel pump
⑩ Igniter unit
⑪ Ignition coil 1
⑫ Ignition coil 2
⑬ Throttle position sensor
⑭ Sidestand switch
⑮ Ignition fuse
⑯ Right handlebar switch
⑰ Front brake switch
⑱ Headlight fuse
⑲ Signal fuse
⑳ Carburetor heater fuse
㉑ Backup fuse
㉒ Left handlebar switch
㉓ Clutch switch
㉔ Horn
㉕ Flasher relay
㉖ Multi-function display
㉗ Neutral switch lead
㉘ Neutral switch
㉙ Headlight
㉚ Front turn signal light (left)
㉛ Front turn signal light (right)
㉜ Rear turn signal light (left)
㉝ Rear turn signal light (right)
㉞ Thermo switch
㉟ Carburetor heater earth
㊱ Carburetor heater 1
㊲ Carburetor heater 2
㊳ Fuel sender
㊴ Tail/brake light
㊵ Oil warning light
㊶ Speed sensor
㊷ Rear brake switch
㊸ Anti-theft alarm (option)
㊹ License plate light
㊺ Igniter fuse
㊻ Parking lighting fuse
㊼ Dimmer switch relay
㊽ Fuel cut solenoid carburetor No. 1
㊾ Fuel cut solenoid carburetor No. 2
㊿ Immobilizer control unit
(51) Carburetor heater 3/4

COLOR CODE

B .....Black
Br .....Brown
Ch .....Chocolate
Dg .....Dark green
G .....Green
Gy .....Gray
L.....Blue
Lg.....Light green
O.....Orange
P .....Pink
R .....Red
Sb .....Sky blue
W .....White
Y .....Yellow
B/L .....Black/Blue
B/W.....Black/White
B/Y .....Black/Yellow
Br/B.....Brown/Black
Br/L .....Brown/Blue
Br/W.....Brown/White
Br/Y.....Brown/Yellow
L/B .....Blue/Black
L/R .....Blue/Red
L/W .....Blue/White
L/Y .....Blue/Yellow
R/B.....Red/Black
R/G .....Red/Green
R/W.....Red/White
R/Y.....Red/Yellow